GENERAL NOTES

1. EACH STRUCTURE IS DESIGNED AS A STABLE UNIT AFTER ALL THE COMPONENTS ARE IN PLACE. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AS REQUIRED TO ENSURE VERTICAL AND LATERAL STABILITY OF THE STRUCTURE AND PORTIONS THEREOF DURING CONSTRUCTION.
2. STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH SPECIFICATIONS AND ALL OTHER DRAWINGS RELATING TO THE WORK.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS AT THE SITE AND SHALL NOTIFY THE CONTRACTING OFFICER OF DISCREPANCIES IF NECESSARAY BETWEEN THE ACTUAL CONDITIONS AND INFORMATION SHOWN ON THE DRAWINGS.
4. LOCATION AND SIZES OF OPENINGS IN FLOORS, ROOFS AND WALLS SHALL BE VERIFIED WITH ARCHITECTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, ELECTRICAL DRAWINGS.
5. NO PIPES, CONDUITS OR DUCTS SHALL BE PLACED IN SLABS, BEAMS, FOOTINGS OR WALLS, UNLESS SPECIFICALLY DETAILED ON STRUCTURAL DRAWINGS.
6. LOCATION AND SIZE OF EQUIPMENT SHALL BE VERIFIED WITH PLUMBING, FIRE PROTECTION, MECHANICAL, ELECTRICAL & MANUFACTURER'S DRAWINGS.
7. SEE PLUMBING, FIRE PROTECTION, MECHANICAL, ELECTRICAL AND MANUFAC-TURER'S DRAWINGS FOR SIZE, LOCATION AND ANCHOR BOLT REQUIREMENTS OF ALL EQUIPMENT. THE CONTRACTOR SHALL OBTAIN MANUFACTURER'S TEMPLATES SHOWING ANCHOR BOLT LOCATION FOR ALL EQUIPMENT.
8. SEE ARCHITECTURAL PLANS FOR LOCATION OF ALL NON-BEARING PARTITIONS, CONCRETE CURBS, FLOOR AND ROOF SLOPES, DRAINS, AND LOCATION AND DETAILS OF ALL MISCELLANEOUS HANDRAILS, LADDERS, HANGERS & STEEL GRATINGS. FOR LOCATION AND DETAIL OF MISCELLANEOUS YARD WORK IN-CLUDING WALKS, CURBS & DRIVEWAYS, SEE CIVIL DRAWINGS.
9. FOR UNDERGROUND UTILITIES, SEE CIVIL DRAWINGS.
10. SPECIFIC NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. DO NOT SCALE DRAWINGS
11. CONTRACTOR SHALL VERIFY EXACT LOCATION, WEIGHT, AND OPENING SIZES OF ROOF & FLOOR MOUNTED EQUIPMENT, WITH THE MANUFACTURER'S SHOP DRAWINGS AND PROVIDE THIS INFORMATION TO THE STEEL FABRICATOR PRIOR TO FABRICATION AND ERECTION.
12. ALL DUCTWORK AND PIPING SHALL BE SUPPORTED AND BRACED IN ACCORDANCE WITH SMACNA GUIDELINES.
13. ALL CONDUITS AND CABLE TRAYS SHALL BE SUPPORTED AND BRACED IN ACCORDANCE WITH SMACNA GUIDELINES.

DESIGN LOADS:

1. DEAD LOADS: ACTUAL CALCULATED WEIGHTS OF PERMANENT STRUCTURES AND ITEMS PERMANENTLY ATTACHED TO THE STRUCTURE.
   10" RAISED FLOOR — 7.0 PSF
2. LIVE LOADS:
   OFFICES — 50 PSF + 15 PSF PARTITIONS (UNIFORM), 2,000 LBS (CONCENTRATED)
   LOBBIES AND FIRST FLOOR CORRIDORS — 100 PSF (UNIFORM), 2,000 LBS (CONCENTRATED)
   CORRIDORS ABOVE FIRST FLOOR — 100 PSF (UNIFORM)
   STORAGE: 2,000 LBS (CONCENTRATED)
   ROOF — 20 PSF
3. LATERAL LOADS:

i) WIND LOAD PER 2007 CALIFORNIA BUILDING CODE
   BASIC WIND SPEED V — 85 MPH
   WIND LOAD IMPORTANCE FACTOR — 1.15
   WIND EXPOSURE — C

ii) SEISMIC LOADS PER 2007 CALIFORNIA BUILDING CODE
   SPECTRAL RESPONSE COEFFICIENTS — S_s = 1.500
   S_1 = 0.602
   OCCUPANCY IMPORTANCE FACTOR — 1.25
   SITE CLASS — D

   BASIC STRUCTURAL SYSTEM

   ORDINARY STEEL CONCENTRICALLY BRACED FRAMES.
   RESPONSE MODIFICATION COEFFICIENT — R = 3.25
   SYSTEM OVER-STRENGTH FACTOR — Ω_o = 2.0
   DEFLECTION AMPLIFICATION FACTOR — Cd = 3.25
   STORY DRIFT AT ROOF — Δ = 2.0 in
   STORY DRIFT AT FLOOR — Δ = 3.5 in

   SPECIAL STEEL MOMENT FRAMES.
   RESPONSE MODIFICATION COEFFICIENT — R = 8.0
   SYSTEM OVER-STRENGTH FACTOR — Ω_o = 3.0
   DEFLECTION AMPLIFICATION FACTOR — Cd = 5.5
   STORY DRIFT AT ROOF — Δ = 2.0 in
   STORY DRIFT AT FLOOR — Δ = 3.0 in

iii) FOR THE WIND DESIGN OF THE CLADDING SYSTEMS, THE HIGH PRESSURE CORNER ZONES DIMENSIONS SHALL BE CALCULATED BASED ON THE OVERALL BUILDING DIMENSIONS BUT SHALL APPLY TO ALL THE CORNERS (OUTSIDE AND INTERMEDIATE) OF THE BUILDING.

APPLICABLE CODES AND STANDARDS

- 2007 CALIFORNIA BUILDING CODE.
- ASCE 7-05, MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.
- ACI 318-05, AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC., THIRTEENTH EDITION.
- 2005 SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS (AISC 341-05)
- 2005 PREQUALIFIED CONNECTIONS FOR SPECIAL AND INTERMEDIATE STEEL MOMENT FRAME FOR SEISMIC APPLICATIONS. (ANSI/AISC 358-05)

FOUNDATION

1. FOUNDATION DESIGN BASED ON GEOTECHNICAL STUDY BY FUGRO WEST, INC. 1000 BROADWAY, SUITE 440 OAKLAND, CA 94607 REPORT NO. 1461.011 DATED OCT. 2008. CONTRACTOR SHALL FOLLOW ALL RECOMMENDATIONS OF THIS REPORT UNO.
2. NET ALLOWABLE BEARING CAPACITY FOR THE FOLLOWING STRUCTURES ARE: 2000 PSF FOR DL, 3000 PSF FOR LL, 4000 PSF FOR DL + E OR W

CONCRETE:

1. UNLESS NOTED OTHERWISE ON THE DRAWINGS OR SPECIFICATIONS, ALL STRUCTURAL CONCRETE SHALL BE HARD ROCK - 145 #/CU.FT., UNLESS NOTED OTHERWISE, AND SHALL HAVE THE FOLLOWING MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS:
   FOOTINGS & GRADE BEAMS — f'c = 4000 PSI
   PEDESTALS — f'c = 3000 PSI
   CONCRETE TOPPING ON METAL DECK — f'c = 4000 PSI
   SLAB ON GRADE — f'c = 3000 PSI
   ALL OTHERS (U.N.O.) — f'c = 3000 PSI
2. ALL CONCRETE MIXES SHALL BE DESIGNED BY A RECOGNIZED TESTING LABORATORY, STAMPED AND SEALED BY A LICENSED CALIFORNIA CIVIL ENGINEER AND SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO PLACING CONCRETE.
3. COMPRESSIVE STRENGTH TEST REPORTS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD.
4. AGGREGATES IN NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C-33.
5. PORTLAND CEMENT : TYPE II FOR CONFORMING TO ASTM C150, LOW ALKALI, MILL TESTED WITH CERTIFICATES OF COMPLIANCE REQUIRED.
6. CONCRETE MIXING OPERATIONS, ETC. SHALL CONFORM TO ASTM C94.
7. UNLESS OTHERWISE SHOWN OR NOTED, CONCRETE COVER FOR REINFORCING BARS TO FACE OF CONCRETE SHALL BE AS FOLLOWS :
   A. CONCRETE IN CONTACT WITH EARTH, UNFORMED --------- 3"
   B. CONCRETE IN CONTACT WITH EARTH, FORMED ------------ 2"
   C. WALL EXTERIOR FACE, EXPOSED TO WEATHER ----------- 2" (FOR #6 BARS & LARGER)
      WALL EXTERIOR FACE, EXPOSED TO WEATHER ------------ 1 1/2" (FOR #5 BARS & SMALLER)
   D. WALL INTERIOR FACE, NOT EXPOSED TO WEATHER ------- 1"
   E. BEAMS, GIRDERS & COLUMNS -------------------------------------- 1 1/2"
      MINIMUM COVER FOR JOISTS, BEAMS, GIRDERS AND COLUMNS SHALL BE TO FACE OF STIRRUPS OR TIES.
   F. SLABS NOT EXPOSED TO WEATHER OR CONTACT WITH GROUND: NO. 11 BAR & SMALLER-- 3/4"
8. ALL REINFORCING BARS, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION PRIOR TO INSPECTION BEFORE PLACING CONCRETE.
9. REFER TO ARCHITECTURAL DRAWINGS FOR MOLDS, GROOVES, ORNAMENTS, CLIPS OR GROUNDS REQUIRED TO BE CAST INTO THE CONCRETE AND FOR EXTENT OF DEPRESSIONS, RAMPS, ETC.
10. SLEEVE PLUMBING OPENINGS IN CONCRETE NEED NOT COMPROMISE BEAMS WALLS AND SLABS BEFORE PLACING CONCRETE APPROVED IN ADVANCE BY THE CONTRACTING OFFICER. BEND REINFORCING AROUND SLEEVES. CORING IS NOT PERMITTED.
11. EXPOSED PROJECTION CORNERS OF SLABS, BEAMS, WALLS, COLUMNS, ETC. SHALL BE FORMED WITH A 3/4" CHAMFER, UNLESS SHOWN OR NOTED OTHERWISE.
12. CURING COMPOUNDS USED ON CONCRETE THAT IS TO RECEIVE A RESILIENT TILE FINISH SHALL BE COMPATIBLE WITH TILE & ADHESIVES OR GROUTS IN ACCORD WITH TILE MANUFACTURER'S DATA.
13. LOCATION OF ALL CONSTRUCTION JOINTS SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER CONTRACTOR SHALL SUBMIT A DRAWING OF THE JOINTS FOR APPROVAL
14. ROUGHEN ALL CONSTRUCTION JOINTS TO A MINIMUM 1/4" AMPLITUDE, EXPOSING AGGREGATE FIRMLY EMBEDDED IN THE CONCRETE.
15. ALL TESTING AND INSPECTION OF CONCRETE SHALL CONFORM WITH THE REQUIREMENTS OF PART 2, TITLE 24, C.B.C. CHAPTER 17 & 19. ALL CONCRETE MATERIALS, AND THE MIXING AND PLACEMENT OF CONCRETE SHALL CONFORM WITH THE REQUIREMENTS OF PART 2, TITLE 24, C.B.C. CHAPTER 19.

REINFORCING STEEL:

1. REINFORCING STEEL SHALL BE DEFORMED STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A615, GRADE 60. REINFORCING TO BE WELDED SHALL BE ASTM A706, GRADE 60.
2. REINFORCING BARS SHALL BE SPLICED AS SHOWN ON DRAWINGS. ANY ADDITIONAL SPLICING SHALL REQUIRE PRIOR APPROVAL FROM THE CONTRACTING OFFICER. WHERE SPLICE LENGTHS ARE NOT EXPLICITLY CALLED OUT ON DETAILS, THE MINIMUM SPLICE (IN COMPRESSION) IS 45 DIAMETERS IN CONCRETE; 65 DIAMETERS IN CONCRETE MASONRY UNITS (IN COMPRESSION OR TENSION) UNLESS NOTED OTHERWISE AND IN TENSION (FOR CONCRETE) AS NOTED ON 7/S002. EMBEDMENT AND HOOK LENGTHS SHALL BE PER DETAIL 17/S002.
3. ALL REINFORCING BARS IN CONCRETE MASONRY UNITS SHALL BE COMPLETELY EMBEDDED IN MORTAR OR GROUT AND SHALL HAVE A COVER OF NOT LESS THAN 1 1/2" NOR LESS THAN 2 1/2 TIMES THE BAR DIAMETER.
4. ALL BARS SHALL BE CLEAN OF RUST, GREASE AND OTHER MATERIALS LIKELY TO IMPAIR BOND. ALL BENDS SHALL BE MADE COLD.

DOWELS TO EXISTING CONCRETE

1. DOWELS NOTED IN DRAWINGS SHALL BE INSTALLED WITH HILTI HIT HY-150 SYSTEM, OR APPROVED EQUAL (ICC # 5193).
2. MINIMUM EMBEDMENT DEPTHS ARE AS FOLLOWS UNLESS NOTED OTHERWISE.

BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10
EMBED	7"	8"	10"	14"	13 1/4"	16"	18"	20"

3. DO NOT DRILL THROUGH OR DAMAGE EXISTING REINFORCING.

STEEL DECK

1. STEEL DECK SHALL CONFORM TO ASTM A653 WITH A MINIMUM YIELD STRESS OF 38 KSI. GALVANIZED PER ASTM A653 & A653M. COATING CLASS G-90.
2. STEEL DECKING SHALL REST TIGHTLY UPON THE TOP FLANGE OF THE SUPPORTING MEMBERS.
3. STEEL DECK MATERIAL AND INSTALLATION SHALL MEET THE REQUIREMENTS OF THE STEEL DECK INSTITUTE'S DESIGN MANUAL.
4. ALL DECKING MATERIAL AND THE FLANGES OF SUPPORTING MEMBERS SHALL BE FREE OF DIRT, SAND, AND OTHER FOREIGN MATERIALS.
5. WATER ON THE DECK OR BETWEEN THE DECK AND SUPPORTING MEMBERS SHALL BE REMOVED BEFORE WELDING.
6. THE STEEL DECK MANUFACTURER SHALL PROVIDE AT LEAST THE FOLLOWING:
   A. SUPPORTS FOR DECK AROUND DISCONTINUITIES.
   B. CLOSURE ANGLES AND DECK REINFORCEMENT AT OPENINGS FOR COLUMNS, BEAM POCKETS, PIPES, DUCTS, CONDUITS, ETC.
7. ALL STEEL DECK SHALL BE CONTINUOUS OVER 2 OR MORE SPANS LESS THAN 6'-0", AND CONTINUOUS OVER 3 OR MORE SPANS GREATER THAN OR EQUAL TO 6'-0" UNLESS NOTED OTHERWISE.
8. ALL STEEL DECK SHALL HAVE A 2" MIN. BEARING ON STEEL SUPPORTS.
9. STEEL DECK WELDING SHALL BE PERFORMED BY WELDERS CERTIFIED FOR LIGHT GAUGE WELDING PER AWS D1.3.

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10. PERIODIC INSPECTION IS REQUIRED FOR ALL DECK WELDING.
11. DECK MANUFACTURER TO IDENTIFY SHORING REQUIREMENTS. PROVIDE SHORING DETAILS ON SHOP DRAWINGS.

SPECIAL INSPECTION:

1. SPECIAL INSPECTION BY A REGISTERED BUILDING INSPECTOR SHALL BE REQUIRED FOR THE FOLLOWING TYPES OF WORK.
   ALL INSPECTIONS SHALL CONFORM WITH THE REQUIREMENTS OF PART 2, TITLE 24, C.B.C. CHAPTER 17. SPECIAL INSPECTORS SHALL BE EMPLOYED BY THE OWNER
   A. PLACEMENT OF COMPACTED FILL.
   B. FOUNDATION WORK.
   C. FINAL PLACEMENT OF REINFORCED CONCRETE.
   D. DURING THE TAKING OF CONCRETE TEST SPECIMENS.
   E. INSTALLATION OF CONCRETE ANCHORS.
   F. INSTALLATION OF BOLTS INSTALLED IN CONCRETE.
   G. WELDING OF LIGHT GAGE STUDS, JOIST & ACCESSORIES.
   H. HIGH STRENGTH BOLTING.
   I. AUTOMATICALLY END WELDED STUDS.
   J. STRUCTURAL STEEL WELDING.
   K. REINF. STEEL PLACEMENT.
   L. WELDING OF REINF STEEL.
   M. STRUCTURAL MASONRY.
   N. SPECIAL GRADING, EXCAVATION & FILLING.
   O. MANUFACTURED TRUSSES.
   P. POST-INSTALLED ANCHORS.

STRUCTURAL STEEL

1. MATERIAL AND WORK SHALL CONFORM TO AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" DATED MARCH 09, 2005
2. MATERIAL FOR STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992 (F_y= 50 KSI) UNO. STRUCTURAL STEEL ANGLES, CHANNELS AND WT SHALL CONFORM TO ASTM A36 U.N.O. PLATES ARE TO BE ASTM 572 GR50 (50ksi).
3. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B, Fy=46KSI
4. STRUCTURAL PIPES SHALL CONFORM TO ASTM A53, GRADE B, Fy=35KSI
5. ALL STRUCTURAL STEEL CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH TYPE BOLTS CONFORMING TO ASTM A325N UNO.
6. ALL BOLTED CONNECTIONS SHALL HAVE A MINIMUM OF TWO (2) BOLTS, UNO.
7. MINIMUM EDGE DISTANCE (DISTANCE FROM CENTER OF BOLT TO NEAREST EDGE OF PLATE OR STRUCTURAL ELEMENT) SHALL BE 2 BOLT DIAMETERS OR 1 1/2" , WHICHEVER IS GREATER, UNLESS NOTED OTHERWISE.
8. ANCHOR BOLTS SHALL BE A307 HEX HEAD BOLTS WITH FLAT WASHERS OR F1554 THREADED RODS WITH NUTS AND FLAT WASHERS UNO ON DWGS.
9. ALL WELDING SHALL CONFORM TO STANDARDS OF AISC, AWS D1.1 & D1.3 USING E70 LOW-HYDROGEN ELECTRODES AND SHALL BE PERFORMED BY WELDERS CERTIFIED PER AWS REQUIREMENTS.
10. CONTINUOUS VISUAL INSPECTION IS REQUIRED PER AWS CODE FOR ALL FIELD WELDING. ALL FULL PENETRATION GROOVE WELDS SHALL BE ULTRASONICALLY INSPECTED.
11. ALL STRUCTURAL STEEL AND MISCELLANEOUS STEEL EXPOSED TO WEATHER SHALL BE GALVANIZED. USE HAND WIRE BRUSHING AT SLIP CRITICAL CONNECTION.
12. GUSSET PLATES SHALL BE 3/8" THICK MINIMUM, UNLESS NOTED OTHERWISE.
13. AUTOMATICALLY END WELD SHEAR CONNECTORS (HEADED STUDS) THROUGH DECK TO SUPPORTING STRUCTURAL MEMBERS IN FIELD, ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND AWS D1.1. REMOVE CERAMIC FERRULES FROM CONNECTOR AND DECK BEFORE PLACING CONCRETE.
14. AUTOMATICALLY END WELD ALL DEFORMED BAR ANCHORS (DBA). USE SAME TESTING AND INSPECTION REQUIREMENTS AS FOR SHEAR CONNECTORS.
15. ALL TESTING AND INSPECTION OF STRUCTURAL STEEL SHALL CONFORM WITH THE REQUIREMENTS OF PART 2, TITLE 24, C.B.C. CHAPTER 17 & 22.

EXPANSION BOLTS, ADHESIVE & SHELL ANCHORS:

1. EXPANSION BOLTS NOTED IN DRAWINGS ARE HILTI KWIK BOLT TZ OR APPROVED EQUAL (ICC # 1917), UNO.
2. ADHESIVE ANCHORS NOTED IN DRAWINGS ARE HILTI RE-500 SD ADHESIVE ANCHOR SYSTEM, OR APPROVED EQUAL (ICC # 2322) WITH F1554 THREADED ROD.
3. SHELL ANCHORS NOTED IN DRAWINGS ARE HILTI HDI DROP-IN ANCHORS, OR APPROVED EQUAL (ICC # 2895) WITH A307 BOLT.
4. MINIMUM EMBEDMENT DEPTHS AS FOLLOWS UNLESS NOTED OTHERWISE.

BOLT & ANCHOR DIAMETER	EXPANSION BOLT MINIMUM EMBEDMENT	ADHESIVE ANCHOR MINIMUM EMBEDMENT	SHELL ANCHOR MINIMUM EMBEDMENT
3/8"	2 1/2"	3 3/8"	1 9/16"
1/2"	3 1/2"	4 1/2"	2"
5/8"	4"	5 5/8"	2 9/16"
3/4"	4 3/4"	6 3/4"	3 3/16"
1"	6"	9"	-

5. DO NOT DAMAGE EXISTING REINFORCEMENT TO PLACE EXPANSION BOLTS AND ADHESIVE/SHELL ANCHORS.
6. CONFORM WITH ICC RECOMMENDED VALUES FOR ANCHOR SPACING AND EDGE DISTANCE TO DEVELOP FULL (100%) ALLOWABLE TENSION/SHEAR LOADS LISTED IN ICC REPORTS. DO NOT USE REDUCED SPACINGS AND EDGE DISTANCES UNLESS SPECIFICALLY NOTED OTHERWISE BY DETAILS.
7. DO NOT USE EXPANSION BOLTS OR SHELL ANCHORS ACTING IN WITHDRAWAL

FOR HEAVY CONTINUOUSLY APPLIED LOADS, FREQUENTLY VIBRATORY LOADS, ETC.

DESIGN AND TEST VALUES FOR DRILLED-IN CONCRETE ANCHORS*

EXPANSION BOLT DIAMETER (INCHES)	EMBEDMENT DEPTH (INCHES)	3000 PSI NWC DESIGN VALUES (POUNDS) * SHEAR	3000 PSI NWC DESIGN VALUES (POUNDS) * TENSION	TENSION TEST (POUNDS)
3/8	2 1/2	880	968	1,940
	4 1/4		1,040	2,080
1/2	3 1/2	1472	1,600	3,200
	6		1,730	3,460
5/8	4	2,500	2,135	4,270
	7		2,600	5,200
3/4	4 3/4	3,380	3,100	6,200
	8		3,700	7,400
1	6	6,900	4,650	9,300
	9		5,750	11,500

SHELL ANCHOR DIAMETER (INCHES)	EMBEDMENT DEPTH (INCHES)	3000 PSI NWC DESIGN VALUES (POUNDS) * SHEAR	3000 PSI NWC DESIGN VALUES (POUNDS) * TENSION	TENSION TEST (POUNDS)
3/8	1 9/16	826	802	1,605
1/2	2	1,286	1,162	2,325
5/8	2 9/16	2,456	2,062	4,125
3/4	3 3/16	3,504	2,824	5,650

* DESIGN VALUES LISTED ARE 80 PERCENT OF ICC VALUES FOR CARBON STEEL ANCHORS ONLY.

1. ANCHOR DIAMETER REFERS TO THE THREAD SIZE.
2. APPLY PROOF TEST LOADS TO WEDGE ANCHORS WITHOUT REMOVING THE NUT IF POSSIBLE. IF NOT, REMOVE NUT AND INSTALL A THREADED COUPLER TO THE SAME TIGHTNESS AS THE ORIGINAL NUT USING A TORQUE WRENCH & APPLY LOAD.
3. WHEN TESTING SHELL ANCHORS, VERIFY THAT THE ANCHOR IS NOT PREVENTED FROM WITHDRAWING BY A BASE PLATE OR OTHER FIXTURE(S). IF RESTRAINT IS FOUND, LOOSEN AND SHIM OR REMOVE FIXTURE(S) PRIOR TO TESTING.
4. REACTION LOADS FROM TEST FIXTURES MAY BE APPLIED CLOSE TO THE ANCHOR BEING TESTED, PROVIDED THE ANCHOR IS NOT RESTRAINED FROM WITHDRAWING BY THE FIXTURE(S).
5. TESTING OF EXPANSION BOLTS SHALL BE IN ACCORDANCE WITH PART 2 TITLE 24 CHAPTER 17 & 19
6. SHELL TYPE ANCHORS SHALL BE TESTED AS FOLLOWS: VISUALLY INSPECT 25 PERCENT FOR FULL EXPANSION AS EVIDENCED BY THE LOCATION OF THE EXPANSION PLUG IN THE ANCHOR BODY. PLUG LOCATION OF A FULLY EXPANDED ANCHOR SHOULD BE AS RECOMMENDED BY THE MANUFACTURER, OR, IN THE ABSENCE OF SUCH RECOMMENDATION, AS DETERMINED ON THE JOB SITE FOLLOWING THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, AND; PROOF LOAD 5 PERCENT AS INDICATED IN THE TABLE ABOVE, BUT NOT LESSTHAN THREE ANCHORS PER DAY FOR EACH DIFFERENT PERSON OR CREW INSTALLING ANCHORS, OR; TEST 50 PERCENT OF THE INSTALLED ANCHORS
7. TEST EQUIPMENT IS TO BE CALIBRATED BY AN APPROVED TESTING LABORATORY IN ACCORDANCE WITH STANDARD RECOGNIZED PROCEDURES.
8. THE FOLLOWING CRITERIA APPLY FOR THE ACCEPTANCE OF INSTALLED ANCHORS: HYDRAULIC RAM METHOD: THE ANCHOR SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE APPLICABLE TEST LOAD. FOR EXPANSION BOLT AND SHELL TYPE ANCHORS, A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER UNDER THE NUT BECOMES LOOSE.
9. TESTING SHOULD OCCUR 24 HOURS MINIMUM AFTER INSTALLATION OF THE SUBJECT ANCHORS. CONCRETE SHALL HAVE OBTAINED PRESCRIBED COMPRESSIVE STRENGTH PRIOR TO INSTALLATION & TESTING.
10. WHEN INSTALLING DRILLED-IN ANCHORS AND / OR POWDER DRIVEN PINS IN NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE REINFORCING BARS.
11. THE TABULATED TENSION VALUES ARE ONLY APPLICABLE WHEN THE ANCHORS ARE INSTALLED WITH SPECIAL INSPECTION AS SET FORTH IN PART 2, TITLE 24 CHAPTER 17
12. THE TABULATED TENSION VALUES ARE FOR ANCHORS INSTALLED WITH THE ANCHOR SPACING AND EDGE DISTANCE RECOMMMEDED BY THE ICC REPORTS.
13. WHEN DRILLED-IN ANCHORS ARE USED FOR CEILING BRACING WIRES, 1 OUT OF 2 MUST BE FIELD TESTED FOR 440 POUNDS IN TENSION. IF ANY DRILLED-IN ANCHOR FAILS, ALL ADJACENT ANCHORS MUST BE TESTED.

STRUCTURAL OBSERVATION

1. STRUCTURAL OBSERVATION AS INDICATED IN THE CALIFORNIA BUILDING CODE SECTION 1702A IS REQUIRED. CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF RECORD (EOR) AT LEAST THREE WORKING DAYS IN ADVANCE TO FACILITATE THE SCHEDULING.
2. SEE PROJECT SPECIFICATIONS AND DRAWINGS FOR ADDITIONAL OBSERVATION REQUIREMENTS AND ALSO FOR OBSERVATION & INSPECTION REQUIREMENTS BY OTHER SPECIALISTS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE EOR 72 HOURS IN ADVANCE OF REQUIRED OBSERVATION(S) FOR SCHEDULING PURPOSES. FAILURE TO MEET OBSERVATION SCHEDULES MAY REQUIRE REMOVAL OF ANY FINISHES THAT HAVE BEEN SUBSEQUENTLY INSTALLED. REMOVAL AND REPLACEMENT OF ANY FINISHES AND/OR FRAMING DAMAGED BY THE FINISH REMOVAL PROCESS OR AS REQUIRED FOR CORRECTIVE ACTION SHALL BE AT THE CONTRACTOR'S EXPENSE, NOT THE OWNER, ENGINEER NOR STRUCTURAL OBSERVER.
4. STRUCTURAL OBSERVATION SHALL BE AT THE FOLLOWING STAGES:
   4.1 AFTER REINFORCING AND FORMS HAVE BEEN SET FOR FOUNDATIONS, SUPPORTING COLUMNS & BRACES RESISTING LATERAL LOADS PRIOR TO CONCRETE POUR.
   4.2 AFTER ERECTION OF THE SECOND FLOOR FRAMING, DECK AND PLACEMENT OF SHEAR STUDS PRIOR TO PLACING CONCRETE DECK FILL
   4.3 ALL BRACED FRAME CONNECTIONS.
   4.4 AFTER ERECTION OF THE ROOF FRAMING AND PRIOR TO PLACEMENT OF EITHER THE CONCRETE FILL, OR THE RIGID INSULATION OVER THE ROOF DECK.

OPEN WEB STEEL JOISTS & GIRDERS

1. JOISTS AND GIRDERS SHALL BE DESIGNED, FABRICATED, AND USE IN CONFORMANCE WITH THE SPECIFICATION OF THE STEEL JOIST INSTITUTE (SJI) LATEST EDITION.
2. THE ENGINEERED JOIST AND GIRDER DESIGN IS THE SOLE RESPONSIBILITY OF THE MANUFACTURER. CONTRACTOR SHALL ERECT JOISTS AND GIRDERS IN CONFORMANCE WITH ALL REQUIREMENTS OF THE SJI, OSHA, AND THE MANUFACTURER'S RECOMMENDATIONS.
3. THE MANUFACTURER SHALL DESIGN JOISTS AND GIRDERS FOR UNIFORM LOADS PLUS ADDITIONAL CONCENTRATED LOADS, AXIAL LOADS, AND BENDING LOADS NOTED ON THE PLANS AND DETAILS, AND TO ACCOMMODATE ALL SPECIAL FRAMING CONDITIONS AS INDICATED OR REQUIRED. ALIGN JOIST PANEL POINTS TO FACILITATE DUCT PASSAGE WHERE REQUIRED BY THE ARCHITECT OR MECHANICAL ENGINEER. SEE PLANS FOR REQUIREMENTS FOR LOADS APPLIED TO TOP AND BOTTOM CHORDS BETWEEN PANEL POINTS. THE MANUFACTURER SHALL BE RESPONSIBLE FOR SIZING, LOCATING AND PROVIDING ANY REQUIRED HORIZONTAL OR DIAGONAL BRIDGING. CAMBER JOISTS AND GIRDERS AS SPECIFIED BY THE SJI.
4. MANUFACTURER SHALL SUPPLY ERECTION DRAWINGS SIGNED BY A CALIFORNIA REGISTERED PROFESSIONAL ENGINEER TO THE CONTRACTOR, FOR REVIEW BY THE ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO FABRICATION. ERECTION DRAWINGS SHALL SHOW ALL CRITICAL DIMENSIONS AND LOADS THE JOISTS AND GIRDERS ARE DESIGNED TO SUPPORT. MANUFACTURER SHALL INCLUDE CERTIFICATION THAT JOISTS AND GIRDERS COMPLY WITH THE SJI SPECIFICATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING BUILDING DEPARTMENT APPROVAL OF ERECTION DRAWINGS PRIOR TO FABRICATION
5. JOISTS AND GIRDERS SHALL BE PAINTED WITH PRIMER UNLESS SPECIFIED OTHERWISE BY THE OWNER OR ARCHITECT. VERIFY COLOR WITH THE ARCHITECT.
6. WOOD NAILERS WHERE SPECIFIED IN THE DETAILS SHALL BE OF DOUGLAS FIR. MANUFACTURER SHALL DESIGN CHORDS ALLOWING FOR #14 SCREW ATTACHMENT HOLES.
7. ALL BEARING SEATS SHALL BE 1/4" THICK MINIMUM. WHERE JOIST OR GIRDER SLOPE EXCEEDS 1/4" PER FOOT, PROVIDE SLOPED BEARING SEAT. THE FOLLOWING JOIST SEAT DEPTHS AND SEAT BEARING LENGTHS SHALL BE UTILIZED UNLESS INDICATED OTHERWISE ON THE PLANS AND DETAILS. SMALLER BEARING LENGTHS SHALL BE CHECKED BY THE MANUFACTURER FOR SHORT BEARING CONDITIONS

JOIST TYPE	SEAT DEPTH (WOOD DECK)	SEAT DEPTH (STEEL DECK)	BEARING LENGTH
K - SERIES	3"	2 1/2"	3"
LH - SERIES	3"	5"	4"
DLH - SERIES	3"	5"	4"
GIRDER	7 1/2"	7 1/2"	4"

8. DEFLECTION CRITERIA FOR DESIGN:
   ROOF TOTAL LOAD = L/240 ROOF LIVE LOAD = L/360
   FLOOR TOTAL LOAD = L/360 FLOOR LIVE LOAD = L/480

STEEL STAIRS:

1. STEEL STAIRS AND HANDRAILS ARE A DEFERRED SUBMITTAL ITEM. SEE DESIGN/BUILD NOTES FOR REQUIREMENTS.
2. STAIRS, HANDRAILS, AND REQUIRED SUPPORT ELEMENTS NOT SHOWN ON STRUCTURAL DRAWINGS SHALL BE DESIGNED BY THE CONTRACTOR PER THE REQUIREMENTS OF THE ARCHITECTURAL DRAWINGS AND THE CBC.
3. STAIRS SHALL BE DESIGNED AND FABRICATED SUCH THAT LOADS ARE TRANSFERRED CONCENTRICALLY TO SUPPORTING MEMBERS, (MEMBERS SHOWN ON STRUCTURAL DRAWINGS), OR ECCENTRICALLY WITH PROPER BRACING SO THAT NO TORSION IS INDUCED INTO SUPPORTING MEMBERS.
4. THE CONTRACTOR SHALL COORDINATE AND PROVIDE FOOTINGS WHERE REQUIRED FOR STAIR SUPPORT AS DESIGNED BY THE STAIR FABRICATOR'S ENGINEER.

ABBREVIATIONS:

&	AND
AB	ANCHOR BOLT
AHU	AIR HANDLING UNIT
ARCH	ARCHITECTURAL
BM	BEAM
BOS	BOTTOM OF STEEL
BOF	BOTTOM OF FOOTING
BOT	BOTTOM
BRCG	BRACING
BS	BOTH SIDES
CANT	CANTILEVER
CIP	CAST IN PLACE
℄	CENTERLINE
CLR	CLEAR
CJ	CONTROL JOINT
CP	COMPLETE PENETRATION
CMU	CONCRETE MASONRY UNITS
COL	COLUMN
COORD	COORDINATE
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
DBA	DEFORMED BAR ANCHOR
DET	DETAIL
DIA	DIAMETER
DWG	DRAWING
DWLS	DOWELS
(E)	EXISTING
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELEV	ELEVATION
EQ	EQUAL OR EQUIPMENT
EW	EACH WAY
EXP	EXPANSION
EXT	EXTERIOR, EXTERNAL
FDN	FOUNDATION
FF	FINISH FLOOR
FIN	FINISH
FLG(S)	FLANGE(S)
FLR	FLOOR
FRMG	FRAMING
FS	FAR SIDE
FTG	FOOTING
FOS	FACE OF STUD
GA	GAGE
HC	HANGER COLUMN
HDR	HEADER
HORIZ	HORIZONTAL
HS	HEADED STUD
HSB	HIGH STRENGTH BOLTS
IE	INVERT ELEVATION
INFO	INFORMATION
INTERMED	INTERMEDIATE
JT	JOINT
KB	KNEE BRACE
LLV	LONG LEG VERTICAL
LONGIT	LONGITUDINAL
LP	LOW POINT
LWC	LIGHT WEIGHT CONCRETE
MAX	MAXIMUM
M B	MACHINE BOLT
MECH	MECHANICAL
MIN	MINIMUM
MISC	MISCELLANEOUS
NF	NEAR FACE
NS	NEAR SIDE
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
OC	ON CENTER
OPP HD	OPPOSITE HAND
OFI	OWNER FURNISHED AND INSTALLED
OPNG	OPENING
PJ	POUR JOINT
℄ (PL)	PLATE
PL	PLATE
PLCS	PLACES
PROJ	PROJECTION
REQD	REQUIRED
REINF	REINFORCING
RM	ROOM
SC	STUB COLUMN
SCHED	SCHEDULE
SECT	SECTION
SLV	SHORT LEG VERTICAL
SIM	SIMILAR
SMS	SHEET METAL SCREWS
SPA	SPACES
SPECS	SPECIFICATIONS
SQ	SQUARE
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
SYMM	SYMMETRY, SYMMETRICAL
TB	TRACK SWITCH BEARING POINT
THD	THREAD
T & B	TOP AND BOTTOM
TO	TOP OF
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
WF	WIDE FLANGE
WWF	WELDED WIRE FABRIC
WD	WOOD
WP	WORK POINT

SYMBOLS & LEGENDS:

DENOTES CAST-IN-PLACE CONCRETE IN SECTIONS

DENOTES CMU WALL IN SECTIONS

1 / S101 — DETAIL NUMBER / SHEET WHERE OCCURS

1 / S101 — DETAIL SECTION / SHEET WHERE OCCURS

1 / S-101 — WALL SECTION NUMBER / SHEET WHERE OCCURS

PROJECT STATUS
PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE

MARK	DATE	DESCRIPTION
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE

DRAWN J NAGANO — DATE
DESIGNED J LIVERMORE — DATE
CHECKED N SHAH — DATE
PROJMGR — DATE
REQUESTOR — DATE
R&QA — DATE
SAFETY — DATE
SUPERVISOR — DATE

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

GENERAL NOTES, SYMBOLS, AND ABBREVIATIONS

SIZE D | CAGE CODE 25307 | A232-0800- | S001 | REV
SCALE | INDEX | SHEET | OF

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STRUCTURAL TESTS, INSPECTIONS, AND OBSERVATIONS

1. PER SECTION 1704 OF CBC 2007, THE FOLLOWING ITEMS SHALL BE INSPECTED AND TESTED BY A DEPUTY INSPECTOR.
2. ALL TESTS AND INSPECTIONS SHALL BE PERFORMED BY A SPECIAL INSPECTOR PER CBC SECTION 1704. THE SPECIAL INSPECTOR SHALL BE EMPLOYED BY THE OWNER, BUT NOT BY THE CONTRACTOR OR ANY OTHER PERSON RESPONSIBLE FOR THE WORK.
3. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED (LICENSED) PERSON WHO SHALL DEMONSTRATE COMPETENCE TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.

LIST OF SPECIAL INSPECTION	YES	NO	N/A
FOUNDATION:			
A. GRADING AND FILLING AND CUT OPERATION PER SOILS REPORT	X		
B. FILL MATERIAL ACCEPTANCE TEST, COMPACTION CONTROL	X		
BEARING CAPACITY OF COMPACTED FILL	X		
CONCRETE:			
A. DURING THE TAKING OF TEST SPECIMENS	X		
PLACING OF REINFORCED CONCRETE	X		
B. SHOTCRETE			X
C. BOLT INSTALLED IN CONCRETE	X		
REINFORCING STEEL & PRE-STRESSING:			
A. DURING PLACING OF REINFORCING, TENDONS & PRE-STRESSED STEEL	X		
B. DURING STRESSING OF POST TENSIONED CONCRETE ELONGATE JACKING FORCE LIFT-OFF FOR EVERY 18TH TENDON			X
C. SAMPLE AND TEST BAR STEEL & POST-TENSION CABLE	X		
STRUCTURAL MASONRY			
A. DURING PREPARATION AND TAKING OF PRISM OR TEST SPECIMENS	X		
B. PLACING OF ALL MASONRY UNITS, REINFORCEMENT, GROUTING AND MASONRY PRISM TEST	X		
STRUCTURAL STEEL:			
A. MILL REPORTS AND IDENTIFICATION OF STEEL (AFADAVIT OF COMPLIANCE)	X		
B. SAMPLING AND TESTING OF SPECIMEN	X		
WELDING:			
A. ALL STRUCTURAL WELDING (INCLUDES DECKING AND WELDED STUDS)	X		
B. ULTRASONIC TESTING OF FULL PENETRATION WELD CONNECTIONS AT MOMENT FRAMES, BRACED FRAMES, BEAM SPLICES, AND FIELD WELDS	X		
C. STRUCTURAL LIGHT GAGE METAL FRAME WELDING	X		
D. REINFORCING STEEL WELDING PER CBC 1704.4.2	X		
BOLT:			
A. HIGH STRENGTH BOLT A325SC & A490SC (TENSION VERIFICATION)	X		
B. HIGH STRENGTH BOLT A325N & A490N (SNUG CONTACT OF PLYS)	X		
C. EXPANSION/ ADHESIVE ANCHORS IN CONCRETE OR MASONRY INSTALLATION AND TESTING	X		
D. ANCHOR BOLTS AT CONCRETE WALLS AND BRACED FRAMES. (BOLT INSTALLATION AND CONCRETE PLACEMENT)	X		

TABLE 1704.3: REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD a.	IBC REFERENCE
1. MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS:				
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	——	X	APPLICABLE ASTM MATERIAL SPECIFICATIONS; AISC 360, SECTION A3.3	——
B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	——	X	——	——
2. INSPECTION OF HIGH-STRENGTH BOLTING:				
A. BEARING TYPE CONNECTIONS.	——	X	AISC 360, SECTION M2.5	1704.3.3
B. SLIP-CRITICAL CONNECTIONS.	X	X		
3. MATERIAL VERIFICATION OF STRUCTURAL STEEL:				
A. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	——	——	ASTM A 6 OR ASTM A 568	1708.4
B. MANUFACTURERS' CERTIFIED MILL TEST REPORTS.	——	——	ASTM A 6 OR ASTM A 568	
4. MATERIAL VERIFICATION OF WELD FILLER MATERIALS:				
A. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.	——	——	AISC 360, SECTION A3.5	——
B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	——	——	——	——
5. INSPECTION OF WELDING:				
A. STRUCTURAL STEEL:	——	——		
1) COMPLETE AND PARTIAL PENETRATION GROOVE WELDS.	X	——	AWS D1.1	1704.3.1
2) MULTIPASS FILLET WELDS	X	——		
3) SINGLE-PASS FILLET WELDS > 5/16"	X	——		
4) SINGLE-PASS FILLET WELDS <= 5/16"	——	X		
5.) FLOOR AND ROOF DECK WELDS.	——	X	AWS D1.3	——
B. REINFORCING STEEL:	——	——	AWS D1.4 ACI 318: 3.5.2	——
1) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706	——	X		
2) REINFORCING STEEL-RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE SHEAR WALLS AND SHEAR REINFORCEMENT.	X	——		
3) SHEAR REINFORCEMENT.	X	——		
4) OTHER REINFORCING STEEL.	——	X		
6. INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS:		X	——	1704.3.2
A. DETAILS SUCH AS BRACING AND STIFFENING.	——	——		
B. MEMBER LOCATIONS	——	——		
C. APPLICATION OF JOINT DETAILS AT EACH CONNECTION	——			

FOR SI: 1 INCH= 25.4 MM.
a. WHERE APPLICABLE, SEE ALSO SECTION 1707.1, SPECIAL INSPECTION FOR SEISMIC RESISTANCE

TABLE 1704.4: REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD a.	IBC REFERENCE
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT.	——	X	ACI 318: 3.5, 7.1-7.7	1913.4
2. INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1704.3, ITEM 5B.	——	——	AWS D1.4 ACI 318: 3.5.2	——
3. INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED.	X	——	——	1911.5
4. VERIFYING USE OF REQUIRED DESIGN MIX.	——	X	ACI 318: CH. 4, 5.2-5.4	1904.2.2, 1913.2, 1913.3
5. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	——	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1913.10
6. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	——	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8
7. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	——	X	ACI 318: 5.11-5.13	1913.9
8. INSPECTION OF PRESTRESSED CONCRETE:	X	——	ACI 318: 18.20 ACI 318: 18.18.4	——
A. APPLICATION OF PRESTRESSING FORCES.				
B. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SEISMIC- FORCE-RESISTING SYSTEM.	X			
9. ERECTION OF PRECAST CONCRETE MEMBERS.	——	X	ACI 318: CH. 16	——
10. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN post tensioned CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	——	X	ACI 318: 6.2	——
11. INSPECT FRAMEWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	——	X	ACI 318: 6.1.1	——

FOR SI: 1 INCH= 25.4 MM.
a. WHERE APPLICABLE, SEE ALSO SECTION 1707.1, SPECIAL INSPECTION FOR SEISMIC RESISTANCE

TABLE 1704.5.3: LEVEL 2 SPECIAL INSPECTION

INSPECTION TASK	FREQUENCY OF INSPECTION: CONTINUOUS DURING TASK LISTED	FREQUENCY OF INSPECTION: PERIODICALLY DURING TASK LISTED	REFERENCE FOR CRITERIA: IBC SECTION	REFERENCE FOR CRITERIA: ACI 530/ASCE 5/ TMS 402 a.	REFERENCE FOR CRITERIA: ACI 530.1/ASCE 6/ TMS 602 a.
1. FROM THE BEGINNING OF MASONRY CONSTRUCTION, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:					
A. PROPORTIONS OF SITE- PREPARED MORTAR, GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS	——	X	——	——	ART. 2.6A
B. PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS	——	X	——	——	ART. 3.3B
C. PLACEMENT OF REINFORCEMENT, CONNECTORS AND PRESTRESSING TENDONS AND ANCHORAGES.	——	X	——	SEC. 1.13	ART. 3.4, 3.6A
D. GROUT SPACE PRIOR TO GROUTING.	X	——	——	——	ART. 3.2D
E. PLACEMENT OF GROUT.	X	——	——	——	ART. 3.5
F. PLACEMENT OF PRESTRESSING GROUT.	X	——	——	——	ART. 3.6C
2. THE INSPECTION PROGRAM SHALL VERIFY:					
A. SIZE AND LOCATION OF STRUCTURAL ELEMENTS.	——	X	——	——	ART. 3.3G
B. TYPE, SIZE, AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES OR OTHER CONSTRUCTION.	X	——	——	SEC. 1.2.2(e), 2.1.4,3.1.6	——
C. SPECIFIED SIZE, GRADE AND TYPE OF REINFORCEMENT.		X	——	SEC. 1.13	ART. 2.4, 3.4
D. WELDING OF REINFORCING BARS	X	——	——	SEC. 2.1.10.7.2, 3.3.3.4(b)	——
E. PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F) OR HOT WEATHER (TEMPERATURE ABOVE 90°F).	——	X	SEC. 2104.3, 2104.4	——	ART. 1.8C, 1.8D
F. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE.	X	——	——	——	ART. 3.6B
3. PREPARATION OF ANY REQUIRED GROUT SPECIMENS, MORTAR SPECIMENS AND/ OR PRISMS SHALL BE OBSERVED.	X	——	SEC. 2105.2.2, 2105.3	——	ART. 1.4
4. COMPLIANCE WITH REQUIRED INSPECTION PROVISIONS OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS SHALL BE VERIFIED.	——	X	——	——	ART. 1.5

FOR SI: °C= (°F-32)/1.8.
a. THE SPECIFIC STANDARDS REFERENCED ARE THOSE LISTED IN CHAPTER 35 OF 2007 IBC

TABLE 1704.7: REQUIRED VERIFICATION AND INSPECTION OF SOILS (BY GEOTECHNICAL ENGINEER)

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. VERIFY MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	——	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	——	X
3. PERFORM CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS.	——	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF CONTROLLED FILL.	X	——
5. PRIOR TO PLACEMENT OF CONTROLLED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	——	X

TABLE 1704.8: REQUIRED VERIFICATION AND INSPECTION OF PILE FOUNDATIONS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. VERIFY PILE MATERIALS, SIZES AND LENGTHS COMPLY WITH THE REQUIREMENTS.	X	——
2. DETERMINE CAPACITIES OF TEST PILES AND CONDUCT ADDITIONAL LOAD TESTS, AS REQUIRED.	X	——
3. OBSERVE DRIVING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH PILE.	X	——
4. VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM TYPE AND SIZE OF HAMMER, RECORD NUMBER OF BLOWS PER FOOT OF PENETRATION, DETERMINE REQUIRED PENETRATIONS TO ACHIEVE DESIGN CAPACITY, RECORD TIP AND BUTT ELEVATIONS AND DOCUMENT ANY PILE DAMAGE.	X	——
~~5. FOR STEEL PILES, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704.3.~~	——	——
6. FOR CONCRETE PILES AND CONCRETE-FILLED PILES, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704.4.	——	——
7. FOR SPECIALTY PILES, PERFORM ADDITIONAL INSPECTIONS AS DETERMINED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.	——	——
~~8. FOR AUGERED UNCASED PILES AND CAISSON PILES, PERFORM INSPECTIONS IN ACCORDANCE WITH SECTION 1704.9.~~	——	——

~~TABLE 1704.9: REQUIRED VERIFICATION AND INSPECTION OF PIER FOUNDATIONS~~

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. OBSERVE DRILLING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH PIER.	X	——
2. VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM PIER DIAMETERS, BELL DIAMETERS (IF APPLICABLE), LENGTHS, EMBEDMENT INTO BEDROCK (IF APPLICABLE) AND ADEQUATE END BEARING STRATA CAPACITY.	X	——
3. FOR CONCRETE PIERS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704.4.	——	——
4. FOR MASONRY PIERS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704.5.	——	——

4. (1705.3) SPECIAL SEISMIC RESISTANCE REQUIREMENTS:

A. THE SEISMIC-FORCE RESISTING SYSTEMS IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E, OR F IN ACCORDANCE WITH SECTION 1613.
B. DESIGNATED SEISMIC SYSTEMS IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E, OR F.
C. THE FOLLOWING ADDITIONAL SYSTEMS AND COMPONENTS IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY C:

C.1. HEATING, VENTILATION, AND AIR-CONDITIONING (HVAC) DUCTWORK CONTAINING HAZARDOUS MATERIALS AND ANCHORAGE OF SUCH DUCTWORK.
C.2. PIPING SYSTEMS AND MECHANICAL UNITS CONTAINING FLAMMABLE, COMBUSTIBLE OR HIGHLY TOXIC MATERIALS.
C.3. ANCHORAGE OF ELECTRICAL EQUIPMENT USED FOR EMERGENCY OR STANDBY POWER SYSTEMS.

D. THE FOLLOWING ADDITIONAL SYSTEMS AND COMPONENTS IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D:

D.1. SYSTEMS REQUIRED FOR SEISMIC DESIGN CATEGORY C
D.2. EXTERIOR WALL PANELS AND THEIR ANCHORAGE.
D.3. SUSPENDED CEILING SYSTEMS AND THEIR ANCHORAGE.
D.4. ACCESS FLOORS AND THEIR ANCHORAGE.
D,5 STEEL STORAGE RACKS AND THEIR ANCHORAGE, WHERE THE IMPORTANCE FACTOR IS EQUAL TO 1.5 IN ACCORDANCE W/ SECTION 15.5.3 OF ASCE 7.

E. THE FOLLOWING ADDITIONAL SYSTEMS AND COMPONENTS IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY E OR F:

E.1 SYSTEMS REQUIRED FOR SEISMIC DESIGN CATEGORIES C AND D.
E.2 ELECTRICAL EQUIPMENT

5. (1705.4.2) SPECIAL WIND INSPECTION REQUIREMENTS:

A. ROOF CLADDING AND ROOF FRAMING CONNECTIONS

B. WALL CONNECTIONS TO ROOF AND FLOOR DIAPHRAGMS AND FRAMING.

C. ROOF AND FLOOR DIAPHRAGM SYSTEMS, INCLUDING COLLECTORS, DRAG STRUTS AND BOUNDARY ELEMENTS.

D. VERTICAL WINDFORCE-RESISTING SYSTEMS, INCLUDING BRACED FRAMES, MOMENT FRAMES AND SHEAR WALLS.

E. WINDFORCE-RESISTING SYSTEM CONNECTIONS TO THE FOUNDATION.

F. FABRICATION AND INSTALLATION OF SYSTEMS OR COMPONENTS REQUIRED TO MEET THE IMPACT-RESISTANCE REQUIREMENTS OF SECTION 1609.1.2.

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
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Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

GENERAL NOTES, CONT.

SIZE	CAGE CODE		REV
D	25307	A232-0800- S002	
SCALE	INDEX	SHEET	OF

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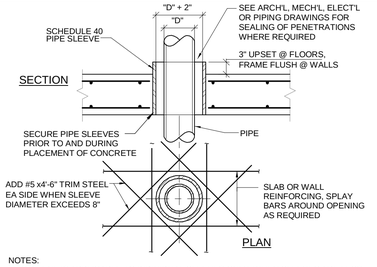
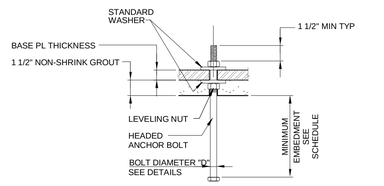


NOTES:
THIS DETAIL IS APPLICABLE TO INDIVIDUAL SLEEVES ONLY. WHEN SLEEVES ARE LESS THAN 3 DIAMETERS APART, OR 2 OR MORE SLEEVES ARE GROUPED, REINFORCE AS A TYPICAL SLAB OR WALL OPENING.

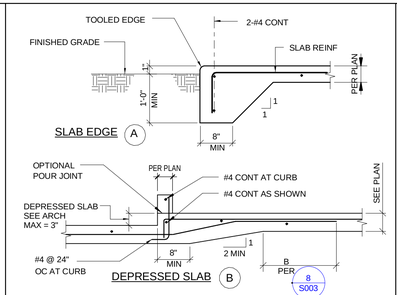
15 | S003 — TYPICAL SLAB AND WALL PIPE SLEEVE
NOT TO SCALE



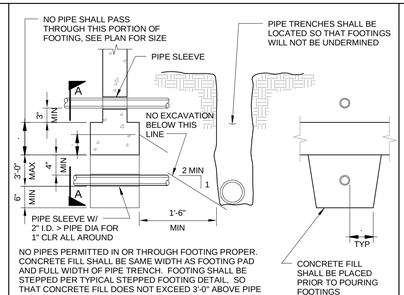
BOLT DIAMETER D	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"	1 1/2"	2"
MINIMUM EMBEDMENT	8"	8"	8"	8"	8"	9"	12"	16"

NOTES: 1. USE MINIMUM EMBEDMENT FOR ALL ANCHOR BOLTS UNLESS SPECIFICALLY DETAILED.
2. AT CONCRETE CURBS ANCHOR BOLT EMBEDMENT IS MEASURED FROM TOP OF ADJACENT SLAB ON GRADE.

11 | S003 — TYPICAL ANCHOR BOLT ASSEMBLY
NOT TO SCALE

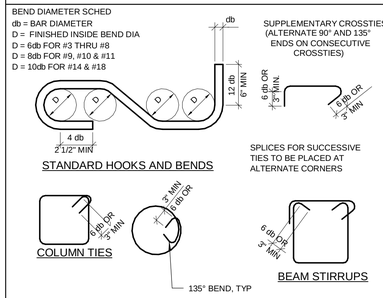


7 | S003 — EXTERIOR SLAB EDGE & DEPRESSED SLAB DETAIL
NOT TO SCALE

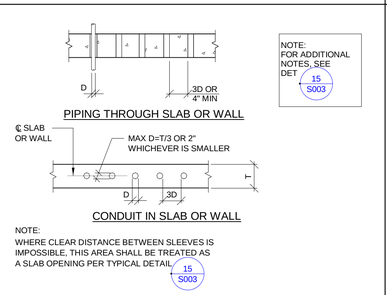


REFERENCE: CBC 1806A.11

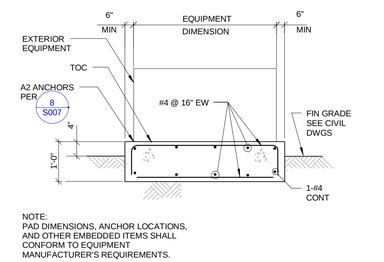
3 | S003 — TYPICAL PIPE AND TRENCH
NOT TO SCALE



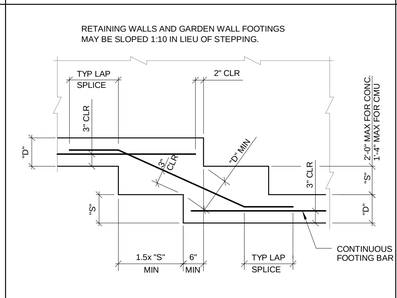
18 | S003 — TYPICAL REINF BAR, BENDS STIRRUPS AND TIES
NOT TO SCALE



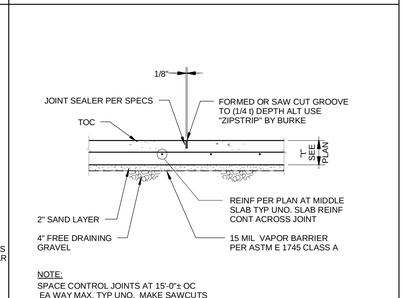
14 | S003 — PIPING AND CONDUIT IN OR THROUGH SLAB OR WALL
NOT TO SCALE



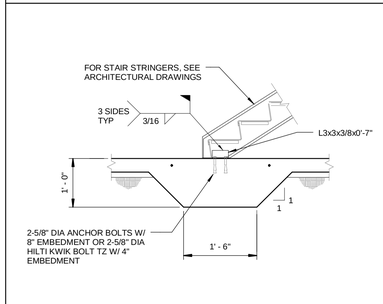
10 | S003 — EXTERIOR EQUIPMENT PAD
NOT TO SCALE



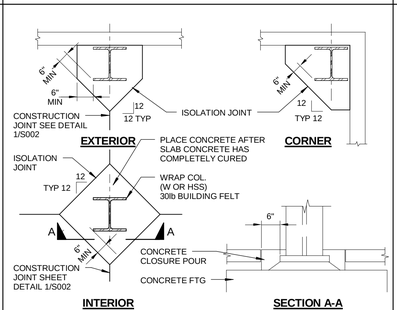
6 | S003 — TYPICAL STEPPED FOOTING DETAIL
NOT TO SCALE



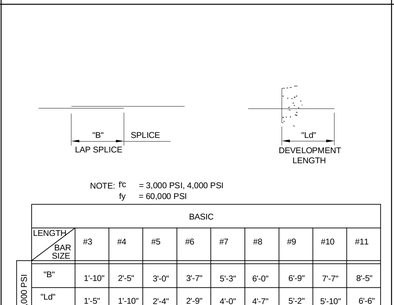
2 | S003 — TYP SLAB ON GRADE CONTROL JOINT
NOT TO SCALE



17 | S003 — STAIR STRINGER FOOTING INTERIOR
SCALE: 3/4" = 1'-0"



13 | S003 — ISOLATION JOINT AT COLUMN
REF: S211 SCALE: 3/4" = 1'-0"



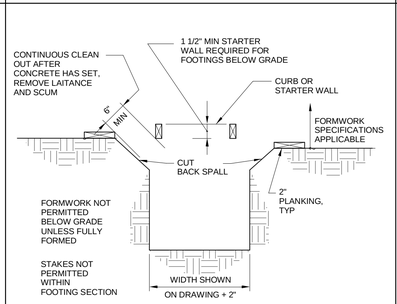
NOTE: f'c = 3,000 PSI, 4,000 PSI
fy = 60,000 PSI

	LENGTH / BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11
BASIC										
3,000 PSI	"B"	1'-10"	2'-5"	3'-0"	3'-7"	5'-3"	6'-0"	6'-9"	7'-7"	8'-5"
	"Ld"	1'-5"	1'-10"	2'-4"	2'-9"	4'-0"	4'-7"	5'-2"	5'-10"	6'-6"
4,000 PSI	"B"	1'-7"	2'-1"	2'-7"	3'-1"	4'-6"	5'-2"	5'-10"	6'-7"	7'-3"
	"Ld"	1'-3"	1'-7"	2'-0"	2'-5"	3'-6"	4'-0"	4'-6"	5'-1"	5'-7"

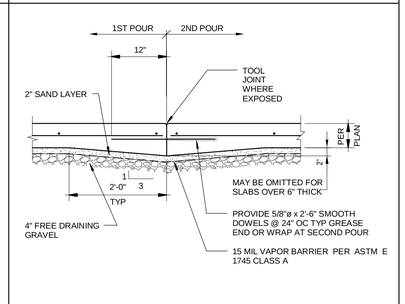
	LENGTH / BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11
TOP BARS										
3,000 PSI	"B"	2'-4"	3'-2"	3'-11"	4'-8"	6'-9"	7'-9"	8'-9"	9'-10"	10'-11"
	"Ld"	1'-10"	2'-5"	3'-0"	3'-7"	5'-3"	6'-0"	6'-9"	7'-7"	8'-5"
4,000 PSI	"B"	2'-1"	2'-9"	3'-5"	4'-1"	5'-11"	6'-9"	7'-7"	8'-6"	9'-5"
	"Ld"	1'-7"	2'-1"	2'-7"	3'-1"	4'-6"	5'-2"	5'-10"	6'-7"	7'-3"

NOTE:
1. TOP BARS ARE HORIZONTAL REINFORCING BARS SO PLACED THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
2. LAP LENGTH SHALL BE THAT OF THE LARGER DIAMETER BAR IN THE SPLICE.
3. SPACING OF THE BARS SHALL BE A MINIMUM OF $2*d_b$

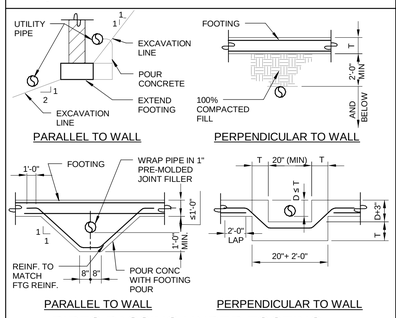
8 | S003 — LAP SPLICE/DEVELOPMENT LENGTH
NOT TO SCALE



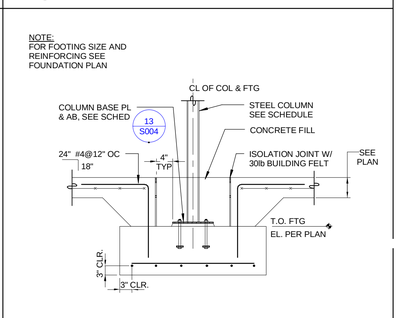
5 | S003 — TYPICAL MANDATORY MINIMUM FORMWORK
NOT TO SCALE



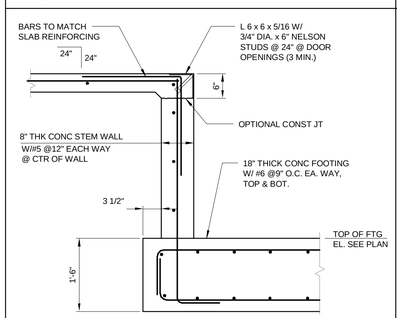
1 | S003 — TYPICAL SLAB ON GRADE CONSTRUCTION JOINT
NOT TO SCALE



16 | S003 — PIPES PASSING UNDER FOOTING THROUGH / ADJACENT TO WALLS
REF: SCALE: 1" = 1'-0"



12 | S003 — TYPICAL COLUMN FOOTING
REF: S211 SCALE: 3/4" = 1'-0"



4 | S003 — TYPICAL SECTION AT PIT
REF: S212 SCALE: 3/4" = 1'-0"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE

MARK	DATE	DESCRIPTION
DRAWN J NAGANO	DATE	
DESIGNED J LIVERMORE	DATE	
CHECKED N. SHAH	DATE	
PROJMGR	DATE	
REQUESTOR	DATE	
R&QA	DATE	
SAFETY	DATE	
SUPERVISOR	DATE	

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

TYPICAL DETAILS

SIZE	CAGE CODE		REV
D	25307	A232-0800- S003	
SCALE	INDEX	SHEET OF	

2/16/2009 4:51:43 PM

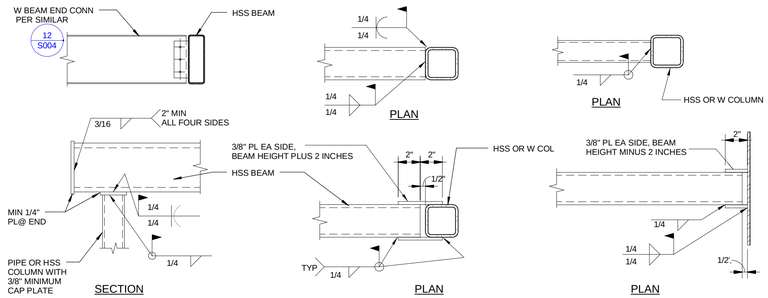
CONNECTION NOTES:

1. BOLTS ARE A325SC, U.N.O.
2. USE SLIP CRITICAL "SC" BOLTS @ DRAG & COLLECTOR MEMBERS. INDICATED ON THE PLAN: ,FOR MORE INFO, SEE 16 S003
3. ALL PLATE'S USE ASTM A572 GR50.

DOUBLE ROW BOLTED COLLECTOR CONNECTION SCHEDULE			
BEAM SIZE	NO. OF BOLTS	CONN. k THK.	WELD SIZE "W"
W12, W14	(6) 1" DIA.	3/8"	1/4"
W16	(8) 1" DIA.	3/8"	5/16
W18	(8) 1" DIA.	1/2"	1/2"
W21, W24	(12) 1" DIA.	5/8"	1/2"
W33	(18) 1 " DIA.	5/8"	3/8"

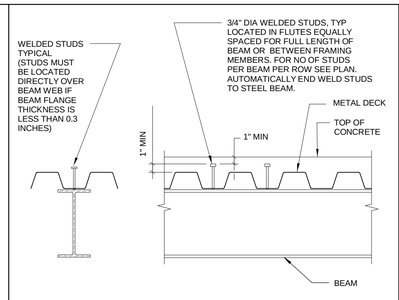
15 S004 COLLECTOR BOLTED CONNECTION SCHEDULE

NOT TO SCALE



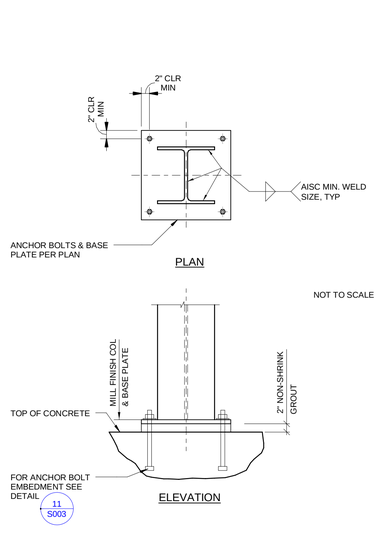
11 S004 TYPICAL HSS BEAM END CONNECTION

REF: SCALE: 3/4" = 1'-0"



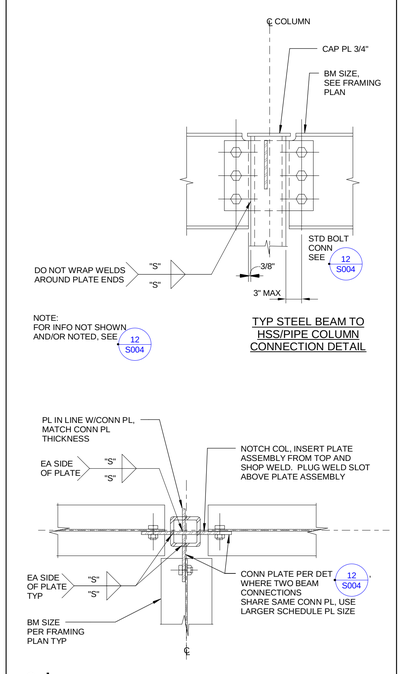
3 S004 TYPICAL HEADED STUD DETAIL

REF: SCALE: 1/2" = 1'-0"



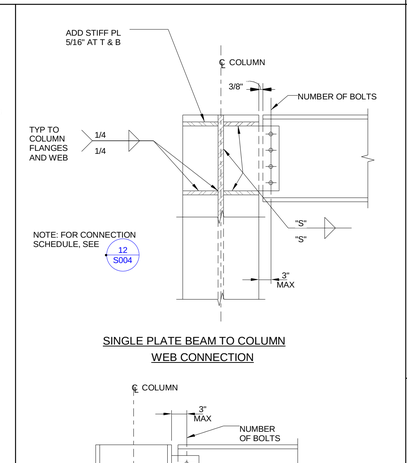
13 S004 TYP WIDE FLANGE GRAVITY COLUMN BASE PLATE DETAIL

REF: S003 SCALE: 3/4" = 1'-0"



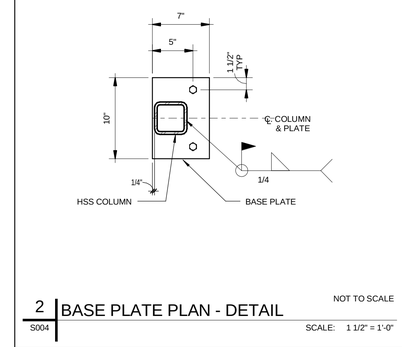
9 S004 TYPICAL PIPE OR HSS COLUMN DETAIL

REF: SCALE: 1/2" = 1'-0"



5 S004 TYPICAL BEAM TO COLUMN CONNECTION DETAIL

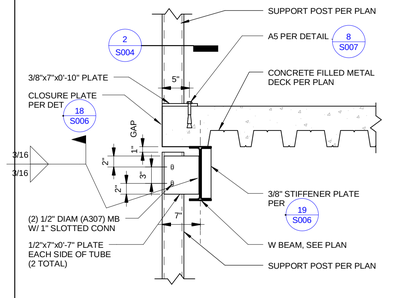
REF: SCALE: 1/2" = 1'-0"



NOT TO SCALE

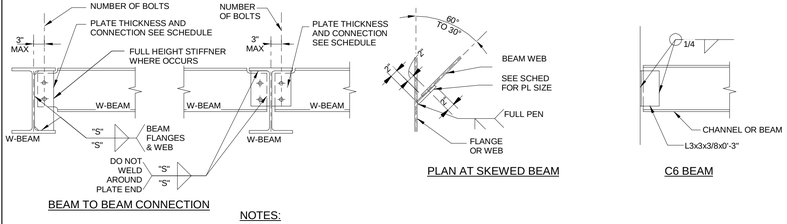
2 S004 BASE PLATE PLAN - DETAIL

SCALE: 1 1/2" = 1'-0"



1 S004 SECTION AT ELEVATOR PIT/SHAFT

REF: SCALE: 1" = 1'-0"



NOTES:

1. BOLTS SPACED @ 3" O.C. TYP UNO. USE 7/8" DIA A325N BOLTS TYP UNO.
2. TYPICAL BOLTS ARE BEARING (N) TYPE BOLTS WITH THE FOLLOWING EXCEPTIONS: FOR BEAMS AT MOMENT CONNECTIONS AND DRAG & COLLECTOR CONNECTIONS 12 S005, 16 S005, 15 S004
3. PROVIDE 2" HORIZ AND 1-3/4" MINIMUM VERTICAL FROM PLATE EDGE AND BEAM WEB EDGE TO CENTERLINE OF BOLT (TYP. UNO). FOR W8 BEAMS, 1 1/2" MIN VERTICAL FROM PLATE EDGE AND BEAM WEB EDGE TO CENTERLINE OF BOLT IS ALLOWED.
4. NUMBER OF BOLTS SCHEDULED ARE TYPICAL.

12 S004 TYPICAL BEAM CONNECTION DETAIL

NOT TO SCALE

BEAM TO BEAM CONNECTION SCHEDULE				
BEAM SIZE	36ksi STEEL PLATE THICKNESS	NUMBER OF BOLTS	WELD SIZE "S"	MINIMUM PLATE HEIGHT
C8, W8, W10	1/4" U.N.O.	2-7/8" DIAM	1/4"	6"
C12, W12, W14	5/16"	3-7/8" DIAM	1/4"	9 1/2"
W16, W18	5/16"	4-7/8" DIAM	1/4"	12 1/2"
W21	5/16"	5-7/8" DIAM	1/4"	16"
W24	1/2"	6-7/8" DIAM	5/16"	19"
W27	1/2"	7-7/8" DIAM	5/16"	22"
W30	1/2"	8-7/8" DIAM	3/8"	25"
W33	1/2"	9-7/8" DIAM	3/8"	28"
W36	1/2"	9-7/8" DIAM	3/8"	28"

NOT TO SCALE

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE
MARK	DATE	DESCRIPTION

DRAWN	J.NAGANO	DATE
DESIGNED	J. LIVERMORE	DATE
CHECKED	N. SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

TYPICAL DETAILS

SIZE	CAGE CODE		REV
D	25307	A232-0800- S004	
SCALE	INDEX	SHEET OF	

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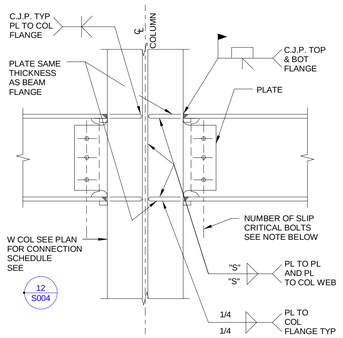
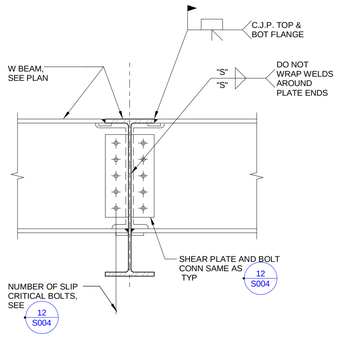
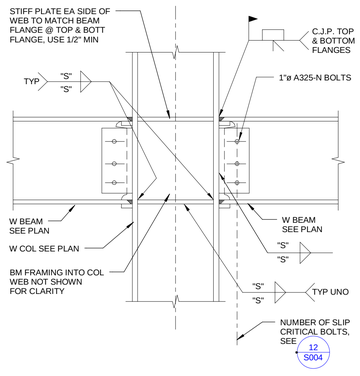


NOTED THUS ON PLANS



NOTED THUS ON PLANS



NOTED THUS ON PLANS

NOTE:

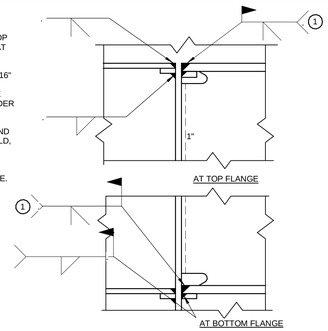
1. IN LIEU OF FIELD BOLTED CONNECTION, CONTRACTOR MAY ELECT TO USE A FIELD WELDED CONNECTION FOR THE BEAM WEB TO SHEAR PLATE CONNECTION. USE FULL LENGTH 5/16" WELD TOP, SIDE AND BOTTOM.
2. THIS DETAIL IS NOT A SPECIAL MOMENT FRAME DETAIL. FOR SPECIAL MOMENT FRAME CONNECTIONS USE 12 S005

16 S005 TYPICAL MOMENT CONNECTION DETAIL

SCALE: 1/2" = 1'-0"

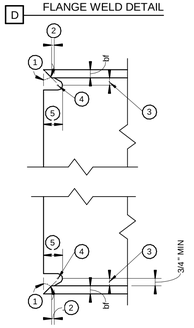
FLANGE WELDING NOTES:

1. CJP GROOVE WELD AT TOP AND BOTTOM FLANGES, AT TOP FLANGE, EITHER (1) REMOVE WELD BACKING BACKGOUGE, AND ADD 5/16" MIN. FILLET WELD, OR (2) LEAVE BACKING IN PLACE AND ADD 5/16" FILLET UNDER BACKING, AT BOTTOM FLANGE REMOVE WELD BACKING BACKGOUGE, AND ADD 5/16" MIN. FILLET WELD, WELD: QC/AQ CATEGORY AH/T.
2. REF C FOR ACCESS HOLE.



D FLANGE WELD DETAIL

TOLERANCES SHALL NOT ACCUMULATE TO THE EXTENT THAT THE ANGLE OF THE ACCESS HOLE CUT TO THE FLANGE SURFACE EXCEEDS 25°.



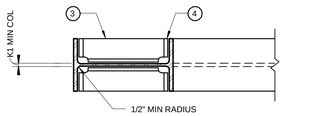
ACCESS HOLE NOTES

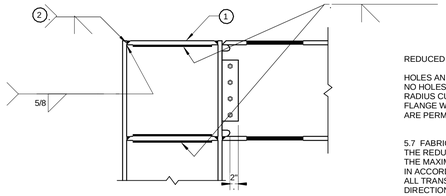
1. BEVEL AS REQUIREED BY AWS D1.1 FOR SELECTED GROOVE WELD PROCEDURE.
2. LARGER OF t OR 1/2 INCH. (PLUS 1/2 t_{bf}. OR MINUS 0.)
3. 3/4" t_{bf}. 3/4" MINIMUM (± 1/2 INCH).
4. 3/8" MINIMUM RADIUS (PLUS NOT LIMITED, OR MINUS 0).
5. 3 t_{bf} (± 1/2 INCH).

C ACCESS HOLE

CONTINUITY PLATE NOTES:

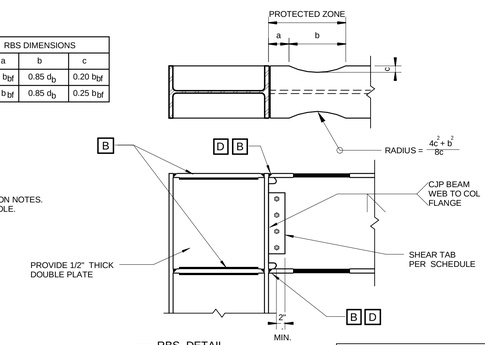
1. CONTINUITY PLATE MINIMUM TO MATCH THICKNESS AND Fy OF BEAM FLANGE. PROVIDE MINIMUM THICKNESS OF 1 3/4".
2. CJP TYPICAL FOR EXTERIOR BEAM-COLUMN CONNECTIONS (BEAM ONE SIDE ONLY). WELD OF CONTINUITY PLATE TO COLUMN FLANGE AT FREE SIDE MAY BE FILLET WELDS AT TOP AND BOTTOM FACE OF PLATE.
3. EXTEND WELD TABS TO 1/4" MAXIMUM FROM EDGE OF CONTINUITY PLATE. GRIND END OF WELD SMOOTH (500U-IN), NOT FLUSH. DO NOT GOUGE COLUMN FLANGE.





B MOMENT FRAME CONTINUITY PL DETAIL

BEAM	RBS DIMENSIONS		
	a	b	c
W24	0.75 b_{bf}	0.85 d_b	0.20 b_{bf}
W27	0.75 b_{bf}	0.85 d_b	0.25 b_{bf}



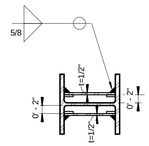
RBS NOTES:
1. SEE DETAIL E FOR FABRICATION NOTES.
2. SEE DETAIL C FOR ACCESS HOLE.

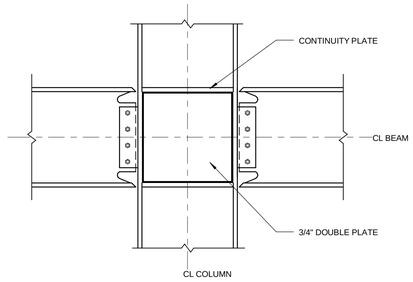
A RBS DETAIL

NOTED THUS ON PLANS

12 S005 TYPICAL MOMENT FRAME CONNECTION

SCALE: 3/4" = 1'-0"





NOTES:
1. DOUBLE PLATE SHALL EXTEND BETWEEN THE TOP AND BOTTOM CONTINUITY PLATES.
2. DOUBLE PLATE ARE OF 50 KSI STEEL.
3. PROVIDE THIS DOUBLE PLATE WHERE THIS DETAIL IS REFERENCED TO ON THE PLANS.

F M.F. COLUMN WEB DOUBLE PLATE DETAIL

REDUCED BEAM SECTIONS (RBS)

HOLES AND ATTACHMENTS:
NO HOLES MAY BE DRILLED OR PUNCHED IN EITHER FLANGE OF THE BEAM WITHIN THE LENGTH THAT HAS RECEIVED THE RADIUS CUT, OR BETWEEN THE RBS CUT AND THE COLUMN. SHEAR STUDS AND MECHANICAL DECK FASTENERS TO THE BEAM FLANGE WITHIN THE LENGTH OF THE RADIUS CUT ARE PROHIBITED. SPOT WELDS FOR THE ATTACHMENT OF METAL DECKING ARE PERMITTED.

5.7 FABRICATION OF FLANGE CUTS
THE REDUCED BEAM SECTION SHALL BE MADE USING THERMAL CUTTING TO PRODUCE A SMOOTH CURVE. THE MAXIMUM SURFACE ROUGHNESS OF THE THERMALLY CUT SURFACE SHALL BE 500 MICROINCHES (13 MICRONS) IN ACCORDANCE WITH ANSI B46.1, AS MEASURED USING AWS C4.1-77 SAMPLE 4 OR SIMILAR VISUAL COMPARATOR. ALL TRANSITIONS BETWEEN THE REDUCED BEAM SECTION AND THE UNMODIFIED BEAM FLANGE SHALL BE ROUNDED IN DIRECTION OF THE FLANGE LENGTH TO MINIMIZED NOTCH EFFECTS DUE TO ABRUPT TRANSITIONS. CORNERS BETWEEN THE REDUCED SECTION SURFACE AND THE TOP AND BOTTOM OF FLANGES SHALL BE GROUND TO REMOVE SHARP EDGES, BUT A MINIMUM CHAMFER OR RADIUS IS NOT REQUIRED.

THERMAL CUTTING TOLERANCES SHALL BE PLUS OR MINUS 1/4in. (6mm) FROM THE THEORETICAL CUT LINE. THE BEAM EFFECTIVE FLANGE WIDTH AT ANY SECTION SHALL HAVE A TOLERANCE OF PLUS OR MINUS 3/8in. (10mm)

GOUGES AND NOTCHES THAT OCCUR IN THE THERMALLY CUT RBS SURFACE MAY BE REPAIRED BY GRINDING IF NOT MORE THAN 1/4in. (6mm) DEEP. THE GOUGED OR NOTCHED AREA SHALL BE FAIRED BY GRINDING SO THAT A SMOOTH TRANSITION EXISTS, AND THE TOTAL LENGTH OF THE AREA GROUND FOR THE TRANSITION SHALL BE NO LESS THAN FIVE TIMES THE DEPTH OF THE REMOVED GOUGE ON EACH SIDE OF THE GOUGE. IF A SHARP NOTCH EXISTS, THE AREA SHALL BE INSPECTED BY MT AFTER GRINDING TO ENSURE THAT THE ENTIRE DEPTH OF NOTCH HAS BEEN REMOVED. GRINDING THAT INCREASES THE DEPTH OF THE RBS CUT MORE THAN 1/4in. (6mm) BEYOND THE SPECIFIED DEPTH OF CUT IS NOT PERMITTED.

GOUGES AND NOTCHES THAT EXCEED 1/4in. (6mm) IN DEPTH, BUT NOT TO EXCEED 1/2in. (12mm) IN DEPTH, AND THOSE NOTCHES AND GOUGES WHERE REPAIR BY GRINDING WOULD INCREASE THE EFFECTIVE DEPTH OF THE RBS CUT BEYOND TOLERANCE, MAY BE REPAIRED BY WELDING. THE NOTCH OR GOUGE SHALL BE REMOVED AND GROUND TO PROVIDE A SMOOTH RADIUS OF NOT LESS THAN 1/4in. IN PREPARATION FOR WELDING. THE REPAIR AREA SHALL BE PREHEATED TO A TEMPERATURE OF 150° F OR THE VALUE SPECIFIED IN AWS D1.1 TABLE 3.2, WHICHEVER IS GREATER, MEASURED AT THE LOCATION OF THE WELD REPAIR.

NOTCHES AND GOUGES EXCEEDING 1/2in. (12mm) IN DEPTH SHALL BE REPAIRED ONLY WITH A METHOD APPROVED BY THE ENGINEER OF RECORD.

WELDED REPAIR OF GOUGES AND NOTCHES:
GOUGES AND NOTCHES THAT EXCEED 1/4 INCH IN DEPTH, BUT NOT TO EXCEED 1/2 INCH IN DEPTH, AND THOSE GOUGES AND NOTCHES WHERE REPAIR BY GRINDING WOULD INCREASE THE EFFECTIVE DEPTH OF THE RBS CUT BEYOND TOLERANCE, MAY BE REPAIRED BY WELDING. GOUGES AND NOTCHING EXCEEDING 1/2 INCH IN DEPTH MAY BE REPAIRED ONLY WITH THE APPROVAL OF THE ENGINEER. THE NOTCH OR GOUGE SHALL BE REMOVED AND GROUND TO PROVIDE A SMOOTH RADIUS OF NOT LESS THAN 3/8 INCH FOR WELDING. THE REPAIR AREA SHALL BE PREHEATED TO A TEMPERATURE BETWEEN 400 °F AND 550 °F, MEASURED AT THE LOCATION OF THE WELD REPAIR APPROXIMATELY ONE MINUTE AFTER REMOVAL OF THE HEATING SOURCE. REPAIR WELDING SHALL BE DONE WITH NOTCH-TOUGH ELECTRODES METTING THE REQUIREMENTS PER FEMA-353, PART I, SECTION 2.4. A REPAIR WPS IS REQUIRED. FOLLOWING WELDING, THE REPAIR WELD SHALL BE GROUND TO A SMOOTH CONTOUR MEETING THE RBS REQUIREMENTS, WITH A SURFACE ROUGHNESS NOT TO EXCEED 500 MICRO INCHES. THE WELDED REPAIR AREA SHALL BE INSPECTED USING MAGNETIC PARTICLE TESTING.

E FABRICATION NOTES

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE
MARK	DATE	DESCRIPTION

DRAWN	J NAGANO	DATE
DESIGNED	J LIVERMORE	DATE
CHECKED	N SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

TYPICAL DETAILS

SIZE	CAGE CODE		REV
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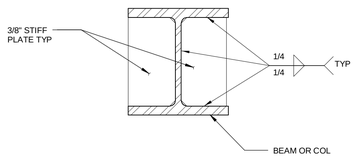
SCALE	INDEX	SHEET OF	

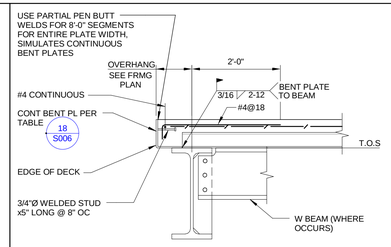
2/16/2009 4:51:51 PM



NOTE:
WELDING SHOWN IS TYPICAL UNLESS NOTED OTHERWISE BY SPECIFIC DETAILS.

19 TYPICAL STIFFENER PLATE DETAIL

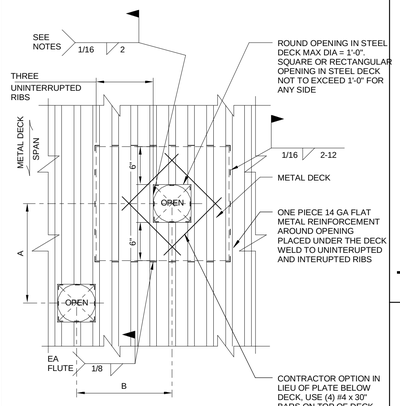
S006 NOT TO SCALE



S05-209

15 DECK PERPENDICULAR-EDGE OF BUILDING

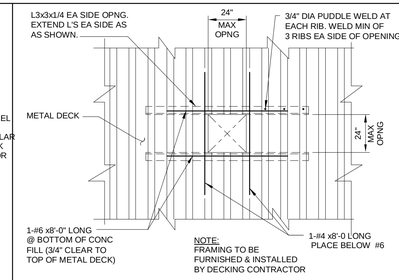
S006 REF: S231 SCALE: 1" = 1'-0"



NOTES:
1. IF DIMENSION "A" IS >4D_1 OR 32" WHICHEVER IS LARGER, THERE IS NO RESTRICTION ON DIMENSION "B".
2. IF DIMENSION "B" IS >4D_1 OR 32" WHICHEVER IS LARGER, THERE IS NO RESTRICTION ON DIMENSION "A".
3. 14 GA DECK REINFORCEMENT FURNISHED AND INSTALLED BY DECKING CONRACTOR.
4. D_1 = LEAST DIMENSION OF OPENING.
5. 3 WELDS EACH SIDE OF OPENING BETWEEN METAL DECK AND 14 GA SHEET.

10 1'-0" OR SMALLER OPENING IN DECK WITH FILL

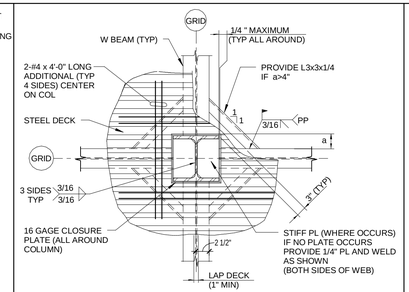
S006 NOT TO SCALE



PLAN - OPENING TO 24" (MAX)

7 2'-0" MAXIMUM OPENING IN DECK WITH FILL

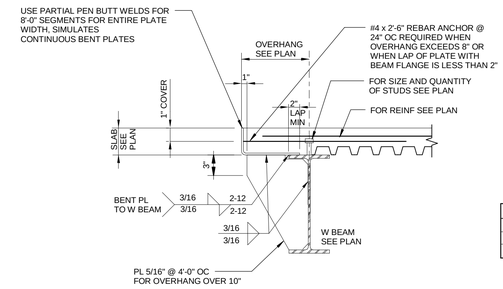
S006 NOT TO SCALE



S05-220

3 S005_03_DECK PLAN AT INTERIOR COLUMN

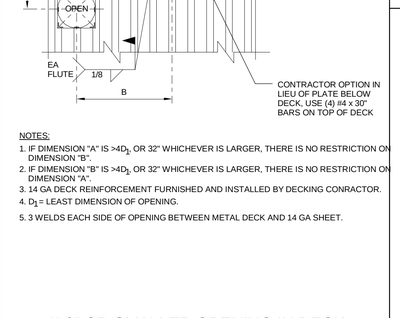
S006 REF: SCALE: 1" = 1'-0"



OVERHANG	BENT PL t
2"-7"	3/16
7 1/4"-10"	1/4
17"	5/16

18 TYPICAL CONCRETE SLAB EDGE DETAIL

S006 NOT TO SCALE

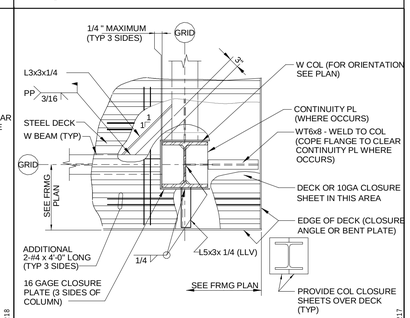


DECK SPANNING PARALLEL TO EDGE

6 DECK PLAN AT PERIMETER COLUMN DECK PARALLEL

S006 REF: SCALE: 1" = 1'-0"

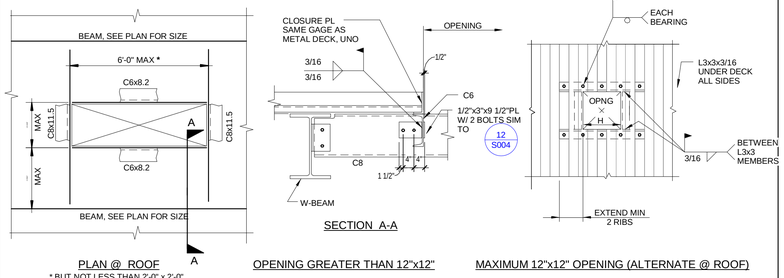
S05-218



S05-217

2 DECK PLAN AT CORNER COLUMN

S006 SCALE: 1" = 1'-0"



PLAN @ ROOF
* BUT NOT LESS THAN 2'-0" x 2'-0"

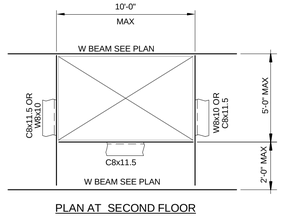
SECTION A-A

OPENING GREATER THAN 12"x12"

MAXIMUM 12"x12" OPENING (ALTERNATE @ ROOF)

NOTES:

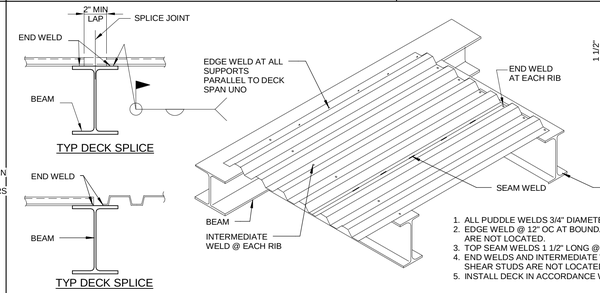
1. FOR LOCATIONS AND SIZE OF OPENINGS, SEE ARCHITECTURAL AND MECHANICAL DWGS. THIS DETAIL IS FOR OPENINGS WHERE BEAM SIZES ARE NOT INDICATED BY THE PLANS.

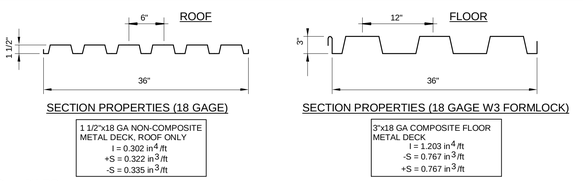


PLAN AT SECOND FLOOR

16 TYPICAL ROOF AND FLOOR OPENING DETAIL

S006 NOT TO SCALE





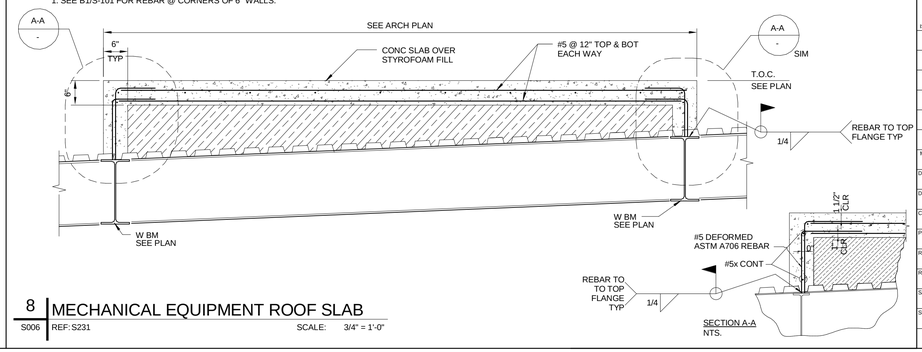
1. ALL PUDDLE WELDS 3/4" DIAMETER TYP UNO.
2. EDGE WELD @ 12" OC AT BOUNDARY PARALLEL TO SUPPORTS WHERE SHEAR STUDS ARE NOT LOCATED.
3. TOP SEAM WELDS 1 1/2" LONG @ 18" OC UNO.
4. END WELDS AND INTERMEDIATE WELDS-7 PUDDLE WELDS PER 36" WIDTH WHERE SHEAR STUDS ARE NOT LOCATED.
5. INSTALL DECK IN ACCORDANCE WITH ICC ER-2078P FOR VERCO DECK.

9 TYPICAL STEEL DECK DETAILS

S006 NOT TO SCALE

NOTE:

1. SEE B1/S-101 FOR REBAR @ CORNERS OF 6" WALLS.



8 MECHANICAL EQUIPMENT ROOF SLAB

S006 REF: S231 SCALE: 3/4" = 1'-0"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
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Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

TYPICAL DETAILS

SIZE	CAGE CODE		REV
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SCALE	INDEX	SHEET OF	

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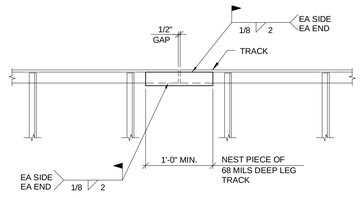
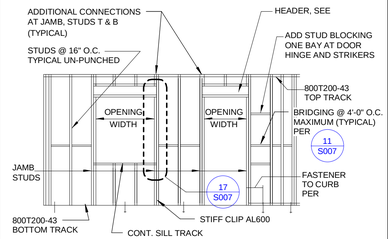


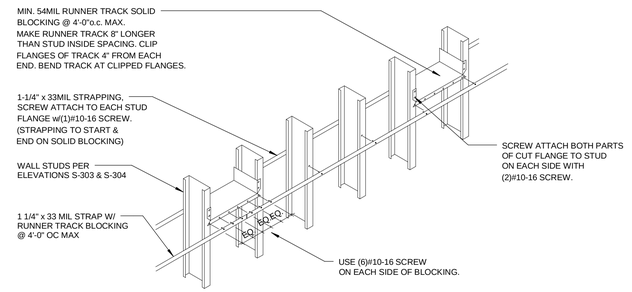
19 TYPICAL TOP TRACK SPLICE DETAIL

S007 SCALE: 3/4" = 1'-0"



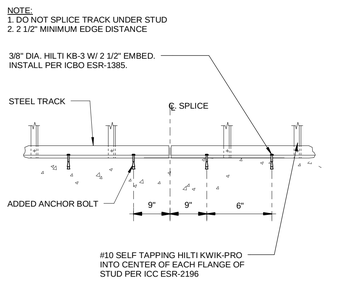
15 EXTERIOR CURTAIN WALL TYP MTL STUD WALL ELEVATION

S007 SCALE: 1 : 1



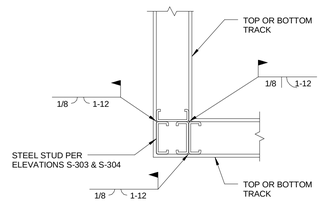
11 NON-COMPOSITE WALL FLANGE BRACING DETAILS

S007 SCALE: 3/4" = 1'-0"



18 TYPICAL BOTTOM TRACK ANCHOR AND SPLICE DETAIL

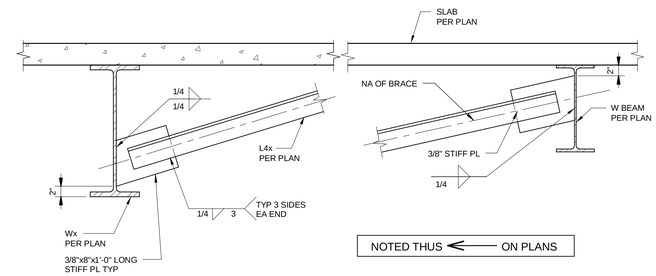
S007 SCALE: 3/4" = 1'-0"



14 TYPICAL DETAIL AT STUD WALL CORNER

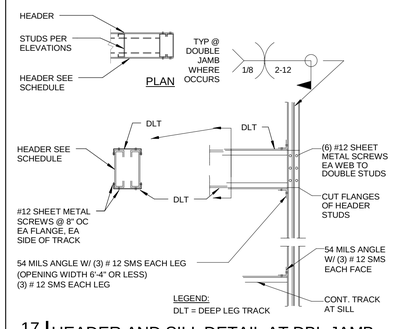
S007 SCALE: 3/4" = 1'-0"

DET-#S05-107



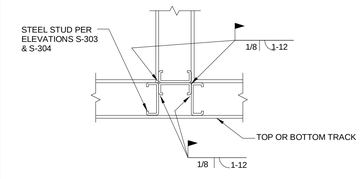
6 DRAG STRUT BOTTOM FLANGE BRACING

S007 SCALE: 1" = 1'-0"



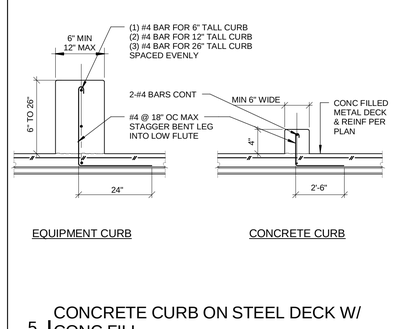
17 HEADER AND SILL DETAIL AT DBL JAMB

S007 SCALE: 1 : 1



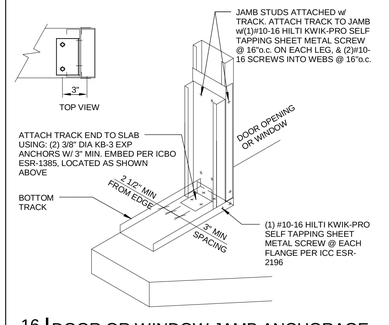
13 TYPICAL DETAIL AT STUD WALL INTERSECTION

S007 SCALE: 3/4" = 1'-0"



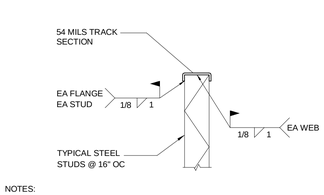
5 CONCRETE CURB ON STEEL DECK W/ CONC FILL

S007 SCALE: 3/4" = 1'-0"



16 DOOR OR WINDOW JAMB ANCHORAGE

S007 SCALE: 3/4" = 1'-0"



NOTES:

1. STUDS TO FULLY BEAR ON TRACK
2. WELD STUDS TO BOTTOM TRACK THE SAME AS TO TOP TRACK.
3. FOR SPLICE OF TRACK SEE DETAIL 19 S007
4. EACH STUD SHALL BE CUT @ TOP TO ACHIEVE FULL BRIDGING.

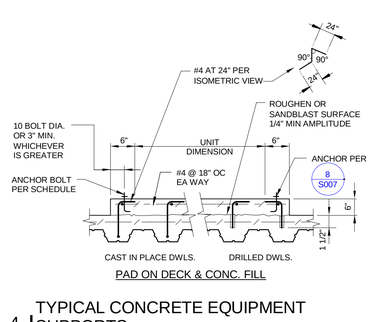
12 TYPICAL STEEL STUDS AT TOP TRACK AT PARAPET

S007 SCALE: 3/4" = 1'-0"

CALLOUT	ANCHOR TYPE
A1	1/2" DIA ASTM F1554 (GR36) THREADED ROD W/ HILTI RE-500 ADHESIVE SYSTEM W/ 5" EMBED. INSTALL PER ICC ESR-2322. SPECIAL INSPECTION REQUIRED.
A2	3/4" DIA ASTM F1554 (GR36) THREADED ROD W/ HILTI RE-500 ADHESIVE SYSTEM W/ 5" EMBED. INSTALL PER ICC ESR-2322. SPECIAL INSPECTION REQUIRED.
A3	SEE DETAIL
A4	3/4" DIA. HILTI KB TZ ANCHORS W/ 4 3/4" EMBEDMENT TYP, INSTALL PER ICC ESR-1917. SPECIAL INSPECTION REQUIRED
A5	1/2" DIA. HILTI KB-TZ ANCHORS W/ 3 1/2" EMBED. INSTALL PER ICC ESR-1917. SPECIAL INSPECTION REQUIRED

8 TYP ANCHORAGE SCHEDULE

S007 SCALE: 1 : 1



4 TYPICAL CONCRETE EQUIPMENT SUPPORTS

S007 SCALE: 3/4" = 1'-0"

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PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
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SUPERVISOR	DATE	

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

TYPICAL DETAILS

SIZE	CAGE CODE		REV
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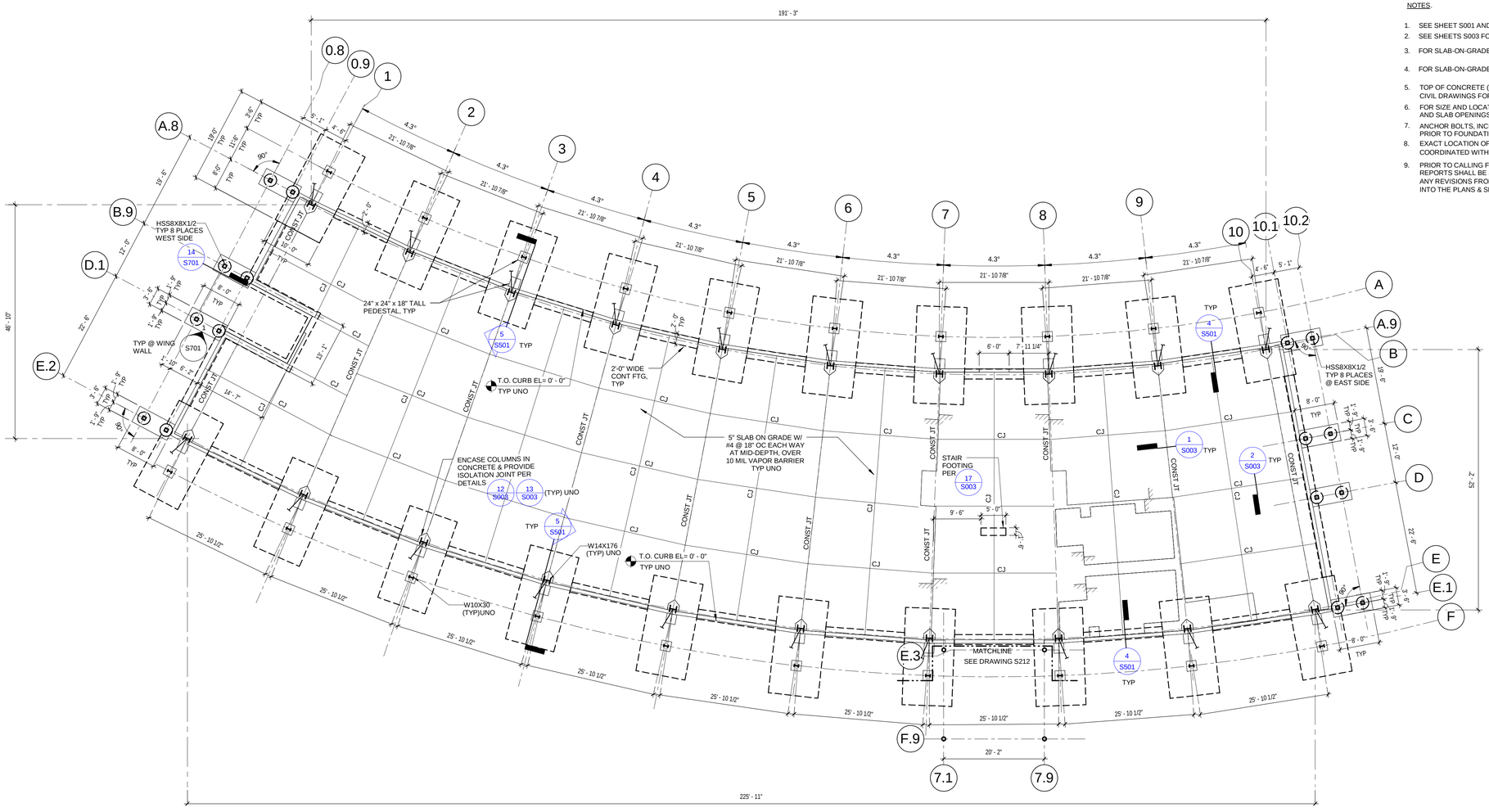
SCALE	INDEX	SHEET OF	



NOTES.

1. SEE SHEET S001 AND S002 FOR GENERAL NOTES.
2. SEE SHEETS S003 FOR TYPICAL FOUNDATION DETAILS.
3. FOR SLAB-ON-GRADE CONSTRUCTION JOINTS SEE DETAIL 1/S003
4. FOR SLAB-ON-GRADE CONTROL JOINTS SEE DETAIL 2/S003
5. TOP OF CONCRETE (T.O.C) IS -0'-10" FROM FINISH FLOOR DATUM ELEVATION SEE CIVIL DRAWINGS FOR SEA LEVEL ELEVATION.
6. FOR SIZE AND LOCATION OF DEPRESSED SLABS, CURBS, ELEVATOR PITS, AND SLAB OPENINGS, REFER TO ARCHITECTURAL DRAWINGS.
7. ANCHOR BOLTS, INCLUDING HOLD-DOWN ANCHORS, SHALL BE TIED IN PLACE PRIOR TO FOUNDATION INSPECTION.
8. EXACT LOCATION OF ELEVATOR GUIDE RAIL SUPPORT POSTS SHALL BE COORDINATED WITH THE ELEVATOR MANUFACTURER.
9. PRIOR TO CALLING FOR FOUNDATION INSPECTION, FINAL GRADING & COMPACTION REPORTS SHALL BE SUBMITTED TO & APPROVED BY THE INSPECTION DEPARTMENT. ANY REVISIONS FROM THE ORIGINAL SOILS REPORT ARE TO BE INCORPORATED INTO THE PLANS & SPECIFICATIONS.

KEY PLAN

NORTH ARROW

BLDG NORTH / TRUE NORTH

SCALE: 3/32" = 1'-0"

0' 4' 12' 24' 42'-8"

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ISSUE		
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R&QA		DATE
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Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

PARTIAL FOUNDATION PLAN NORTH WING

SIZE	CAGE CODE		REV
D	25307	A232-0800- S211	
SCALE	INDEX	SHEET OF	

2/16/2009 5:20:22 PM

NOTES.

1. SEE SHEET S001 AND S002 FOR GENERAL NOTES.
2. SEE SHEETS S003 FOR TYPICAL DETAILS.
3. FOR SLAB-ON-GRADE CONSTRUCTION JOINTS SEE DETAIL 1/S003
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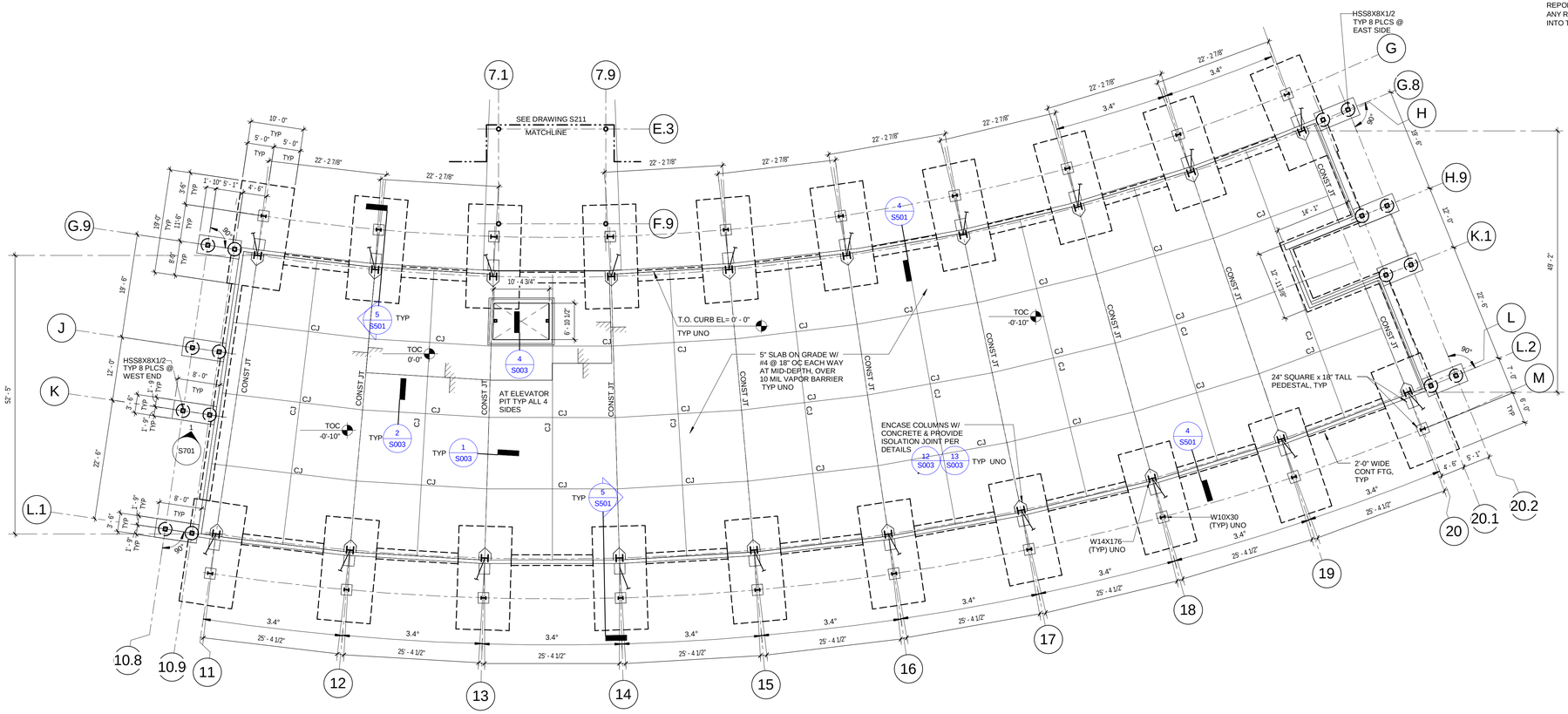

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ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE
MARK	DATE	DESCRIPTION

KEY PLAN

NORTH ARROW: BLDG NORTH, TRUE NORTH

SCALE: 3/32" = 1'-0"

0' 4' 12' 24' 42'-8"

DRAWN	J. NAGANO	DATE
DESIGNED	J. LIVERMORE	DATE
CHECKED	N. SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

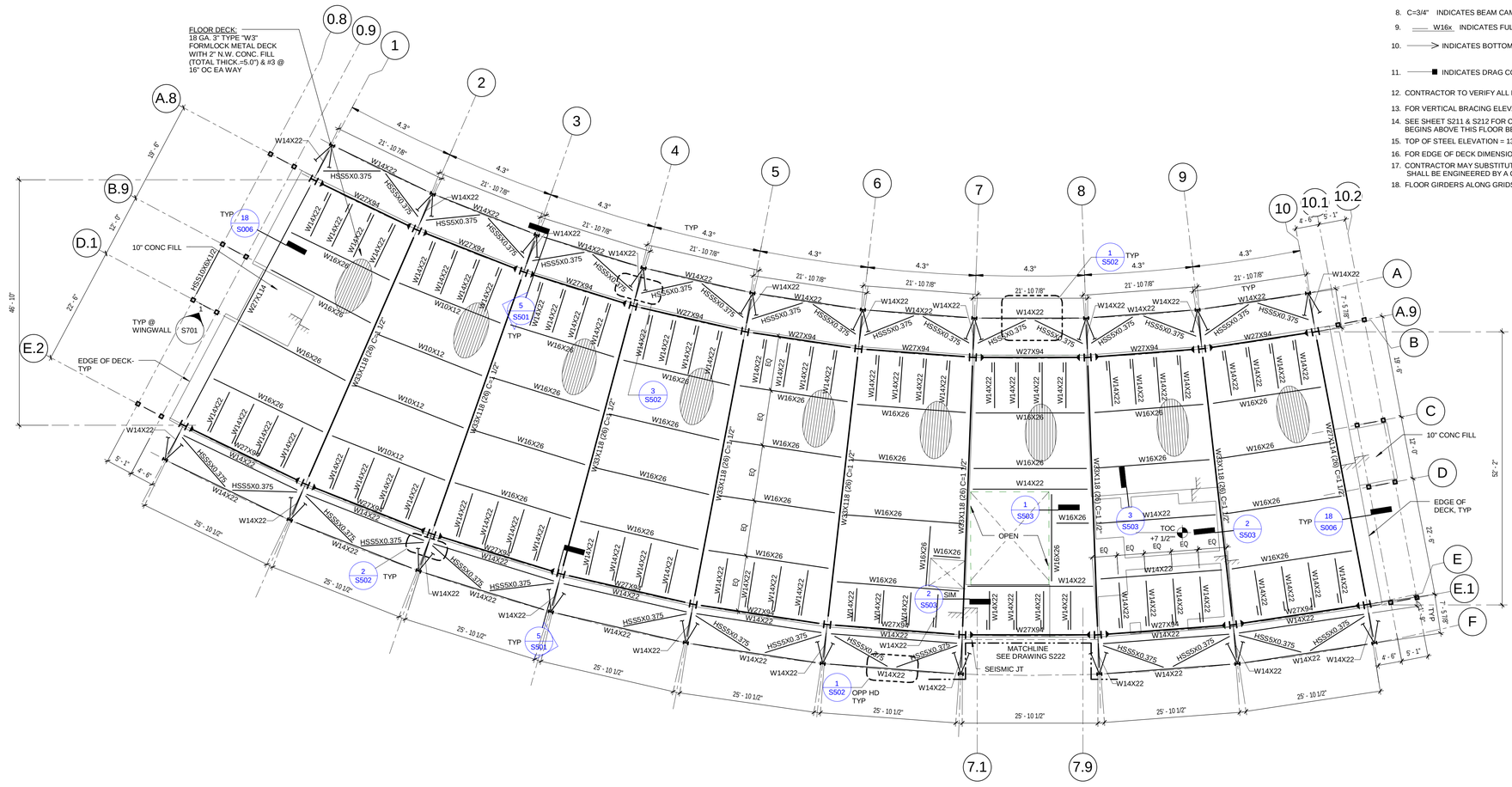
Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

PARTIAL FOUNDATION PLAN SOUTH WING

SIZE	CAGE CODE		REV
D	25307	A232-0800- S212	
SCALE		INDEX	SHEET OF

2/16/2009 4:52:14 PM



NOTES:

1. SEE SHEET S001 AND S002 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
2. SEE SHEETS S-003 THRU S-007 FOR TYPICAL DETAILS.
3. CENTERLINE OF W COLUMNS AT GRID LINE, TYPICAL UNO.
4. FOR METAL DECK SECTION PROPERTIES & WELDING REQUIREMENTS, SEE DETAIL 9/S006
5. PROVIDE 3/4"x4.0" TALL HEADED STUDS FOR ALL BEAMS AT 1'-0" O.C. TYPICAL UNO.
6. ▶—◀ INDICATES FULL MOMENT CONNECTION PER TYPICAL DETAIL 12/S005
7. ▷—— INDICATES TYPICAL MOMENT CONNECTION PER DETAIL 16/S005
8. C=3/4" INDICATES BEAM CAMBER.
9. ═══ W16x INDICATES FULL HEIGHT SHEAR TAB PER. 12/S004
10. ——> INDICATES BOTTOM FLANGE BRACE PER TYPICAL DETAIL 6/S007 EQUALLY SPACED ALONG BEAM SPAN TYP, U.N.O.
11. ——■ INDICATES DRAG CONNECTION PER TYPICAL DETAIL 15/S004
12. CONTRACTOR TO VERIFY ALL DIMENSIONS RELATED TO ELEVATOR.
13. FOR VERTICAL BRACING ELEVATIONS, SEE SHEET S-501.
14. SEE SHEET S211 & S212 FOR COLUMN SIZES WHICH EXTEND TO FOUNDATION. COLUMNS WITH SIZES NOTED ON THIS SHEET, BEGINS ABOVE THIS FLOOR BEAM TOP OF STEEL LEVEL.
15. TOP OF STEEL ELEVATION = 13'-3" U.NO.
16. FOR EDGE OF DECK DIMENSIONS, REFER TO ARCHITECTURAL DRAWINGS.
17. CONTRACTOR MAY SUBSTITUTE CASTELLATED GIRDERS IN LIEN OF THE W33X11 FLOOR GIRDERS CASTELLATED FLOOR GIRDERS SHALL BE ENGINEERED BY A CALIFORNIA REGISTERED PROFESSIONAL ENGINEER.
18. FLOOR GIRDERS ALONG GRIDS 2-9 SHALL HAVE WEB OPENING AS DETAILED IN

KEY PLAN

NORTH ARROW

BLDG NORTH
TRUE NORTH

SCALE: 3/32" = 1'-0"

0' 4' 12' 24' 42'-8"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
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MARK	DATE	DESCRIPTION

DRAWN	J. NAGANO	DATE
DESIGNED	J. LIVERMORE	DATE
CHECKED	N. SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

PARTIAL SECOND FLOOR FRAMING PLAN NORTH WING

SIZE	CAGE CODE		REV
D	25307	A232-0800- S221	
SCALE	INDEX	SHEET OF	

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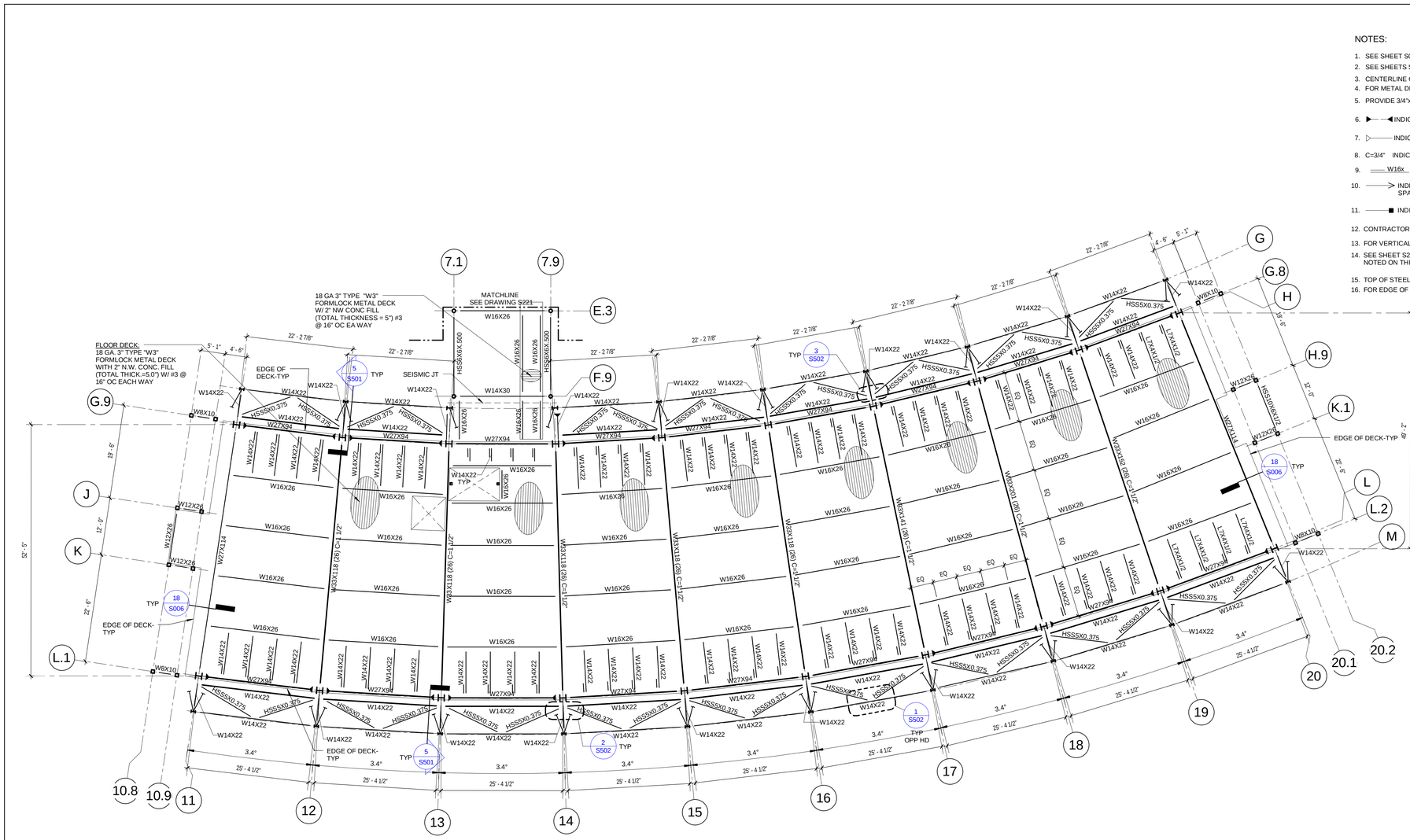

NOTES:

1. SEE SHEET S001 AND S002 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
2. SEE SHEETS S003 THRU S007 FOR TYPICAL DETAILS.
3. CENTERLINE OF W COLUMNS AT GRID LINE, TYPICAL UNO.
4. FOR METAL DECK SECTION PROPERTIES & WELDING REQUIREMENTS, SEE DETAIL 9/S006
5. PROVIDE 3/4"x4.5" TALL HEADED STUDS FOR ALL BEAMS AT 1'-0" O.C. TYPICAL UNO.
6. ▶—◀ INDICATES FULL MOMENT CONNECTION PER TYPICAL DETAIL 12/S005
7. ▷—— INDICATES TYPICAL MOMENT CONNECTION PER DETAIL 16/S005
8. C=3/4" INDICATES BEAM CAMBER.
9. ═══ W16x INDICATES FULL HEIGHT SHEAR TAB PER 12/S004
10. ——> INDICATES BOTTOM FLANGE BRACE PER TYPICAL DETAIL 6/S007, EQUALLY SPACED ALONG BEAM SPAN TYP, U.N.O.
11. ——■ INDICATES DRAG CONNECTION PER TYPICAL DETAIL 15/S004
12. CONTRACTOR TO VERIFY ALL DIMENSIONS RELATED TO ELEVATOR.
13. FOR VERTICAL BRACING ELEVATIONS, SEE SHEET S-501.
14. SEE SHEET S211 & S212 FOR COLUMN SIZES WHICH EXTEND TO FOUNDATION. COLUMNS WITH SIZES NOTED ON THIS SHEET, BEGINS ABOVE THIS FLOOR BEAM TOP OF STEEL LEVEL.
15. TOP OF STEEL ELEVATION = 13'-3" U.NO.
16. FOR EDGE OF DECK DIMENSIONS, REFER TO ARCHITECTURAL DRAWINGS.

KEY PLAN

NORTH ARROW

BLDG NORTH
TRUE NORTH

SCALE: 3/32" = 1'-0"

0' 4' 12' 24' 42'-8"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
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4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE
MARK	DATE	DESCRIPTION

DRAWN	J NAGANO	DATE
DESIGNED	J LIVERMORE	DATE
CHECKED	N SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

PARTIAL SECOND FLOOR FRAMING PLAN SOUTH WING

SIZE	CAGE CODE		REV
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SCALE		INDEX SHEET OF	

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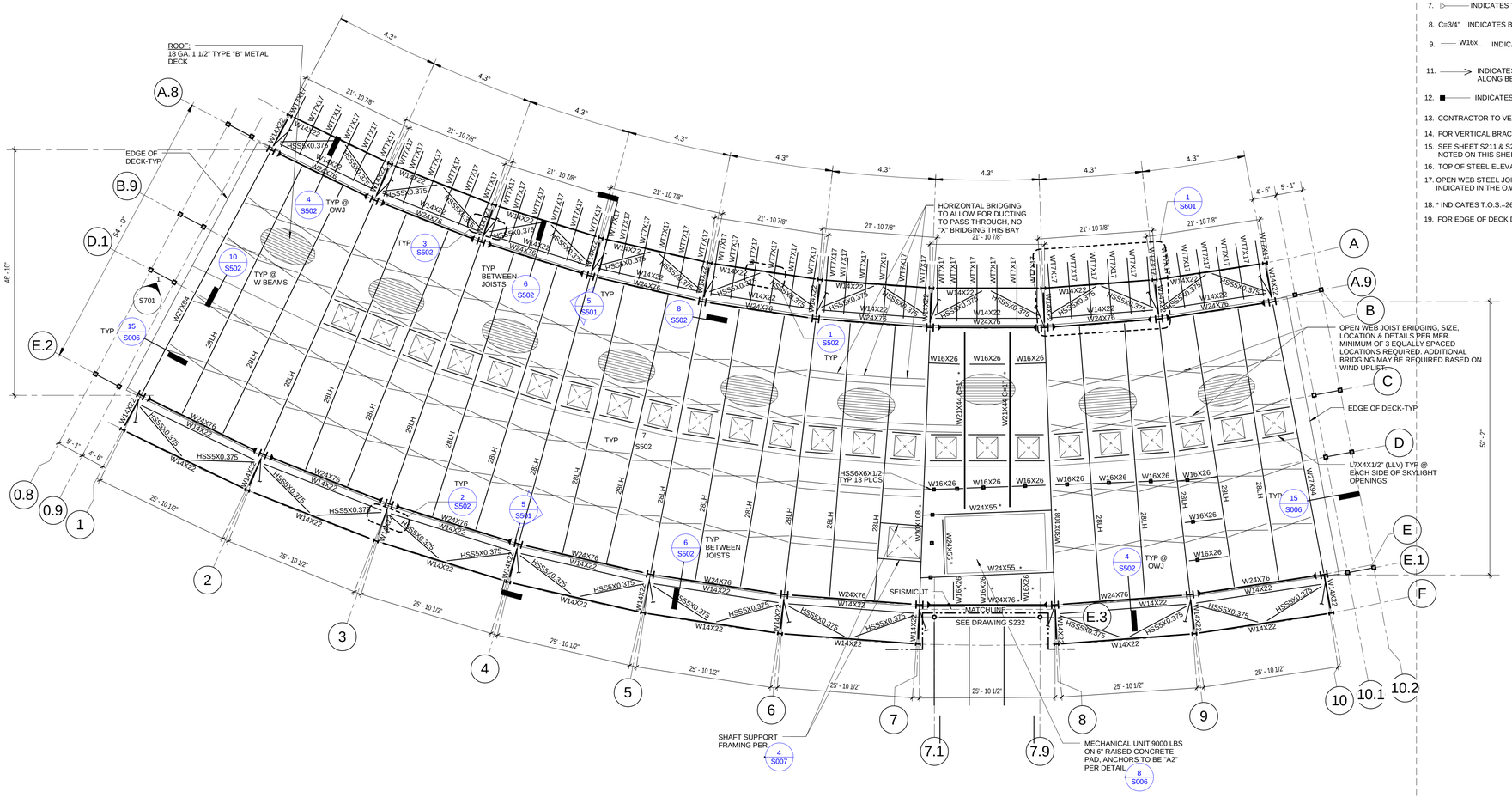
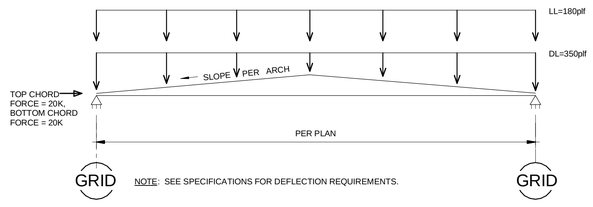


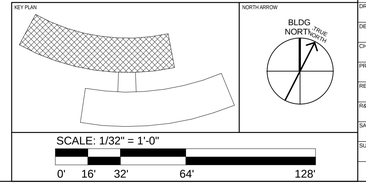
NOTES:

1. SEE SHEET S001 AND S002 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
2. SEE SHEETS S003 THRU S007 FOR TYPICAL DETAILS.
3. CENTERLINE OF W COLUMNS AT GRID LINE, TYPICAL UNO.
4. FOR METAL DECK SECTION PROPERTIES & WELDING REQUIREMENTS, SEE DETAIL 8/S007
5. PROVIDE 3/4"x4.5" TALL HEADED STUDS FOR ALL BEAMS AT 1'-0" O.C. TYPICAL UNO.
6. ▶—◀ INDICATES FULL MOMENT CONNECTION PER TYPICAL DETAIL 12/S005
7. ▷—— INDICATES TYPICAL MOMENT CONNECTION PER DETAIL 16/S005
8. C=3/4" INDICATES BEAM CAMBER.
9. ═ W16x INDICATES FULL HEIGHT SHEAR TAB PER. 12/S004
11. ——> INDICATES BOTTOM FLANGE BRACE PER TYPICAL DETAIL 6/S007, EQUALLY SPACED ALONG BEAM SPAN TYP, U.N.O.
12. ■—— INDICATES DRAG CONNECTION PER TYPICAL DETAIL 15/S004
13. CONTRACTOR TO VERIFY ALL DIMENSIONS RELATED TO ELEVATOR.
14. FOR VERTICAL BRACING ELEVATIONS, SEE SHEET S-501.
15. SEE SHEET S211 & S212 FOR COLUMN SIZES WHICH EXTEND TO FOUNDATION. COLUMNS WITH SIZES NOTED ON THIS SHEET, BEGINS ABOVE THIS FLOOR BEAM TOP OF STEEL LEVEL.
16. TOP OF STEEL ELEVATION = 26'-6" U.N.O., T.O. O.W.J.=26'-11" U.N.O.
17. OPEN WEB STEEL JOISTS SHALL BE DESIGNED IN ACCORDANCE W/ THE MINIMUM DESIGN LOADS INDICATED IN THE O.W.J. LOADING DIAGRAM, THIS SHEET.
18. * INDICATES T.O.S.=26'-11"
19. FOR EDGE OF DECK DIMENSIONS, REFER TO ARCHITECTURAL DRAWINGS.



1 S231 OWJ LOADING DIAGRAM

NOT TO SCALE



PROJECT STATUS

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MARK	DATE	DESCRIPTION

DRAWN	J. NAGANO	DATE
DESIGNED	J. LIVERMORE	DATE
CHECKED	N. SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

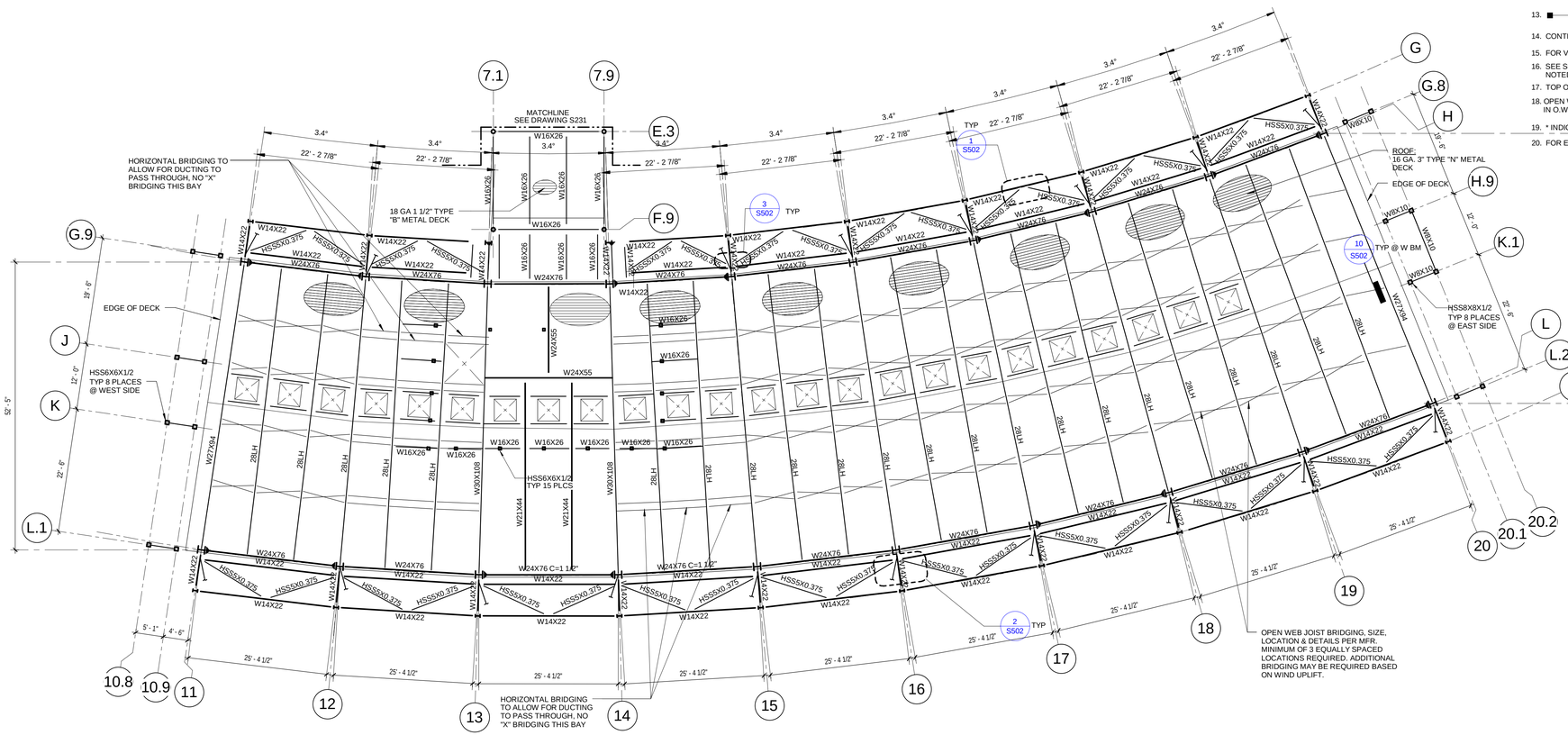
PARTIAL ROOF FRAMING PLAN NORTH WING

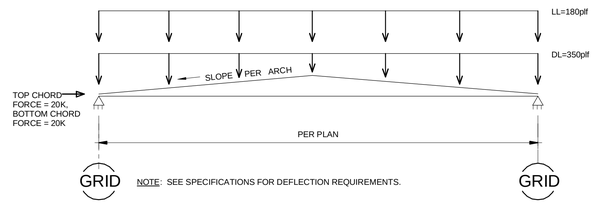
SIZE	CAGE CODE		REV
D	25307	A232-0800- S231	
SCALE		INDEX SHEET OF	

2/16/2009 4:52:21 PM

NOTES:

1. SEE SHEET S001 AND S002 FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
2. SEE SHEETS S003 THRU S007 FOR TYPICAL DETAILS.
3. CENTERLINE OF W COLUMNS AT GRID LINE, TYPICAL UNO.
4. FOR METAL DECK SECTION PROPERTIES & WELDING REQUIREMENTS, SEE DETAIL 9/S006
7. PROVIDE 3/4"x4.5" TALL HEADED STUDS FOR ALL BEAMS AT 1'-0" O.C. TYPICAL UNO.
8. ▶—◀ INDICATES FULL MOMENT CONNECTION PER TYPICAL DETAIL 12/S005
9. ▷— INDICATES TYPICAL MOMENT CONNECTION PER DETAIL 16/S005
10. C=3/4" INDICATES BEAM CAMBER.
11. W16x INDICATES FULL HEIGHT SHEAR TAB PER 12/S004
12. → INDICATES BOTTOM FLANGE BRACE PER TYPICAL DETAIL 6/S007 - EQUALLY SPACED ALONG BEAM SPAN TYP, U.N.O.
13. ■— INDICATES DRAG CONNECTION PER TYPICAL DETAIL 15/S004
14. CONTRACTOR TO VERIFY ALL DIMENSIONS RELATED TO ELEVATOR.
15. FOR VERTICAL BRACING ELEVATIONS, SEE SHEET S-501.
16. SEE SHEET S211 & S212 FOR COLUMN SIZES WHICH EXTEND TO FOUNDATION. COLUMNS WITH SIZES NOTED ON THIS SHEET, BEGINS ABOVE THIS FLOOR BEAM TOP OF STEEL LEVEL.
17. TOP OF STEEL ELEVATION = 26'-6" U.N.O., T.O. O.W.J.=26'-11" U.N.O.
18. OPEN WEB STEEL JOISTS SHALL BE DESIGNED IN ACCORDANCE W/ THE MINIMUM DESIGN LOADS INDICATED IN O.W.J. LOADING DIAGRAM, THIS SHEET.
19. * INDICATES T.O.S.=26'-11"
20. FOR EDGE OF DECK DIMENSIONS, REFER TO ARCHITECTURAL DRAWINGS.





NOTE: SEE SPECIFICATIONS FOR DEFLECTION REQUIREMENTS.

1 S232 OWJ LOADING DIAGRAM

NOT TO SCALE

KEY PLAN

NORTH ARROW

BLDG NORTH / TRUE NORTH

SCALE: 3/32" = 1'-0"

0' 4' 12' 24' 42'-8"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
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4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE
MARK	DATE	DESCRIPTION

DRAWN	J. NAGANO	DATE
DESIGNED	J. LIVERMORE	DATE
CHECKED	N. SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

PARTIAL ROOF FRAMING PLAN SOUTH WING

SIZE	CAGE CODE		REV
D	25307	A232-0800- S232	
SCALE	INDEX	SHEET OF	

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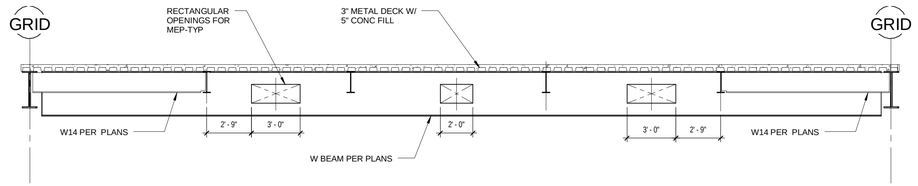


1 TYPICAL GIRDER OPENINGS

S301 REF:

SCALE: 1/4" = 1'-0"

2/16/2009 4:52:25 PM

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE

MARK	DATE	DESCRIPTION
DRAWN: J NAGANO	DATE	
DESIGNED: J LIVERMORE	DATE	
CHECKED: N. SHAH	DATE	
PROJMGR	DATE	
REQUESTOR	DATE	
R&QA	DATE	
SAFETY	DATE	
SUPERVISOR	DATE	

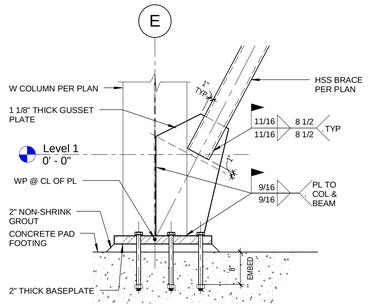
Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

TYPICAL GIRDER OPENINGS AT GRID LINES 2-9 & GRID LINES 11-19

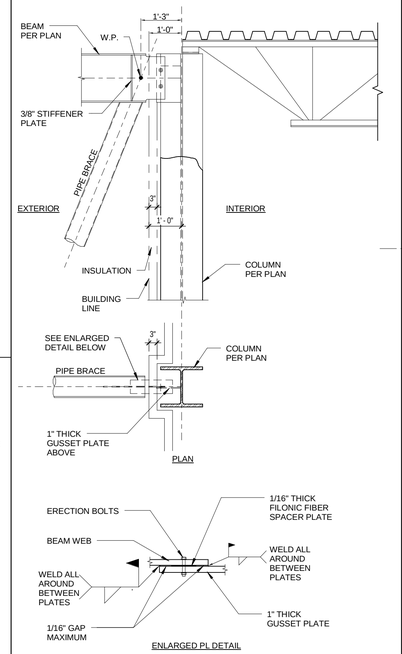
SIZE	CAGE CODE		REV
D	25307	A232-0800- S301	

SCALE | INDEX | SHEET | OF



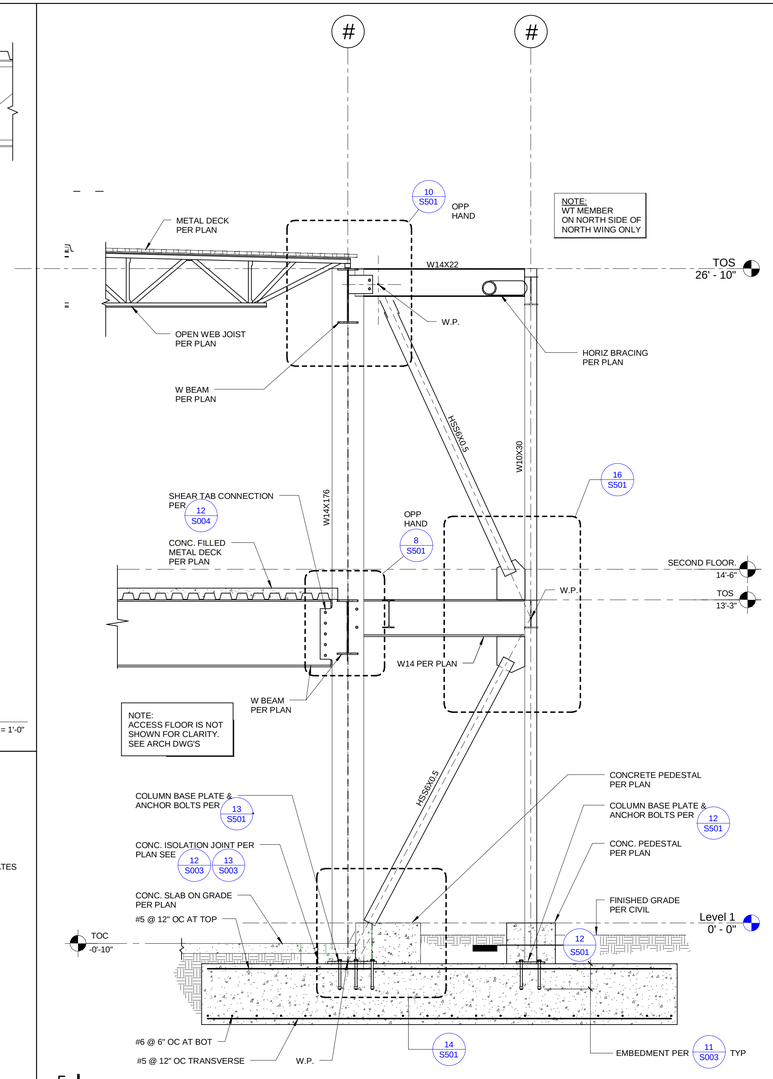
14 TYPICAL BRACE CONN AT FOUNDATION

S501 | REF: S501 | SCALE: 3/4" = 1'-0"



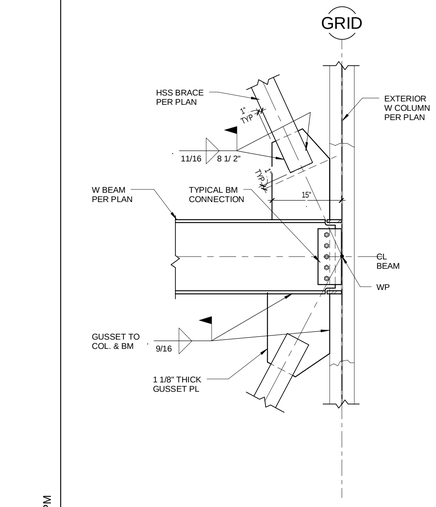
10 BRACE CONNECTION AT ROOF

S501 | REF: S501 | SCALE: 1/2" = 1'-0"



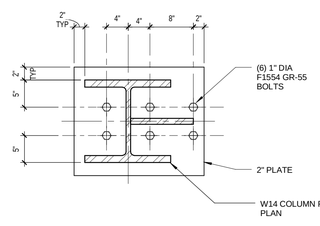
5 TYPICAL BRACED FRAME ELEVATION

S501 | REF: S211 | SCALE: 3/8" = 1'-0"



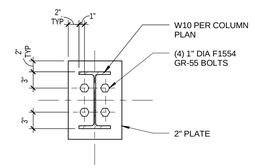
16 BRACE CONNECTION AT 2ND FLOOR

S501 | REF: S501 | SCALE: 3/4" = 1'-0"



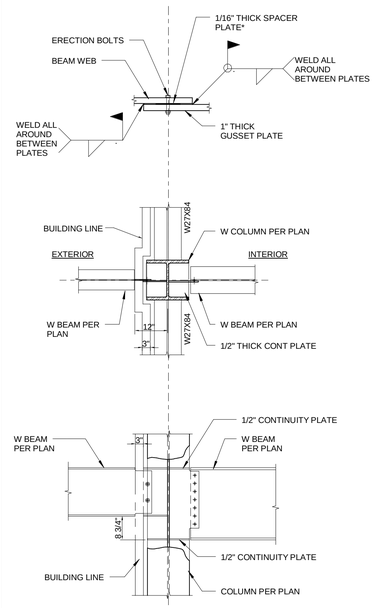
13 COLUMN BASEPLATE

S501 | REF: S501 | SCALE: 1" = 1'-0"



12 EXTERIOR COLUMN BASEPLATE

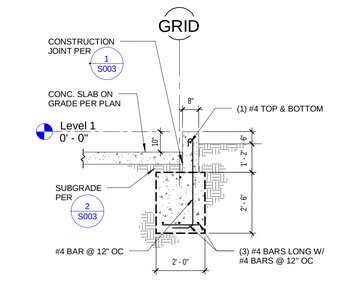
S501 | REF: S501 | SCALE: 1" = 1'-0"



* SPACER MATERIAL MUST BE ABLE TO WITHSTAND THE HEAT DURING THE WELDING PROCESS THIS MUST BE AN APPROVED PRODUCT FOR SIMILAR USE.

8 BEAM TO BEAM CONN. AT 2nd FLOOR

S501 | REF: S501 | SCALE: 1/2" = 1'-0"



4 CURB FOUNDATION DETAIL

S501 | REF: S211 | SCALE: 3/8" = 1'-0"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
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MARK	DATE	DESCRIPTION
DRAWN: J NAGANO	DATE	
DESIGNED: J LIVERMORE	DATE	
CHECKED: N SHAH	DATE	
PROJMGR	DATE	
REQUESTOR	DATE	
R&QA	DATE	
SAFETY	DATE	
SUPERVISOR	DATE	

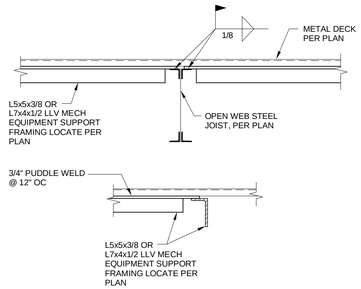
Ames Research Center
Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

SECTIONS AND DETAILS

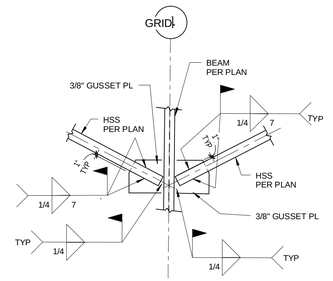
SIZE	CAGE CODE		REV
D	25307	A232-0800- S501	
SCALE	INDEX	SHEET OF	

2/16/2009 5:13:18 PM



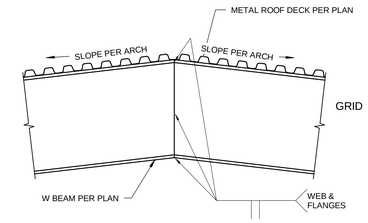
7 ANGLE/DECK CONNECTION AT JOIST

S502 | REF: | SCALE: 3/4" = 1'-0"



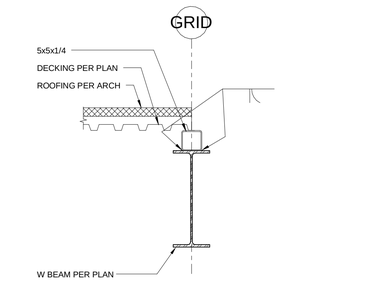
3 BRACE DETAIL BETWEEN BEAM

S502 | REF: S221 | SCALE: 3/8" = 1'-0"



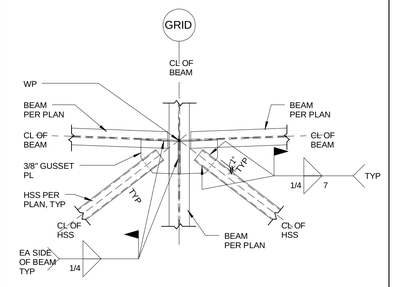
10 ROOF BEAM CONN @ RIDGE

S502 | REF: S231 | SCALE: 3/4" = 1'-0"



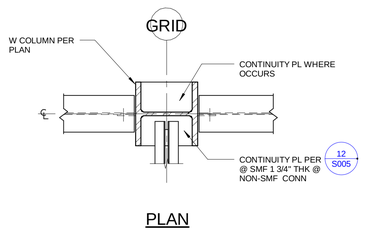
6 BEAM TO BEAM CONNECTION

S502 | REF: S231 | SCALE: 3/4" = 1'-0"

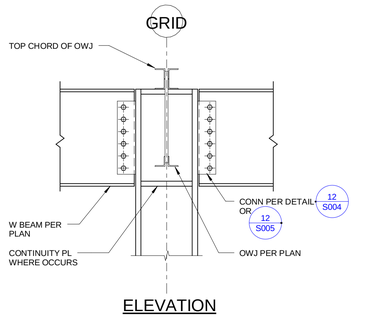


2 HSS/BEAM BRACE DETAIL

S502 | REF: S221 | SCALE: 1/2" = 1'-0"



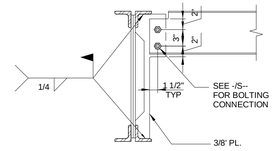
PLAN



ELEVATION

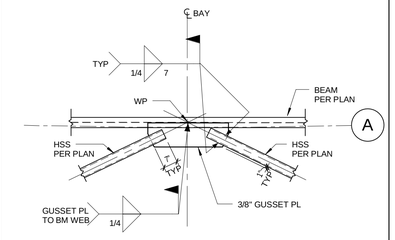
8 OWJ CONN AT COUMN

S502 | REF: S231 | SCALE: 3/4" = 1'-0"



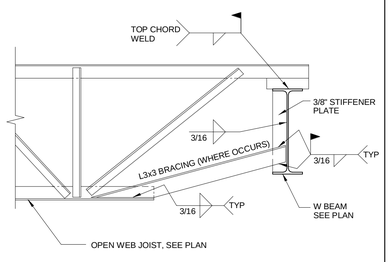
5 BEAM CONNECTION TO OWJ

S502 | REF: | SCALE: 1" = 1'-0"



1 GUSSET PL HSS BRACE DETAIL

S502 | REF: S221 | SCALE: 3/8" = 1'-0"



4 BOTTOM FLANGE BEAM BRACING

S502 | REF: S231 | SCALE: 1" = 1'-0"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
2	11/07/2008	30% DESIGN REVISION
3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
4	12/19/2008	60% PRE-FINAL, NASA REVIEW
5	02/16/2009	90% QAQC & COST ESTIMATE

MARK	DATE	DESCRIPTION
DRAWN J NAGANO	DATE	
DESIGNED J LIVERMORE	DATE	
CHECKED N SHAH	DATE	
PROJMGR	DATE	
REQUESTOR	DATE	
R&QA	DATE	
SAFETY	DATE	
SUPERVISOR	DATE	

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Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

BRACE DETAILS

SIZE	CAGE CODE		REV
D	25307	A232-0800- S502	
SCALE	INDEX	SHEET OF	

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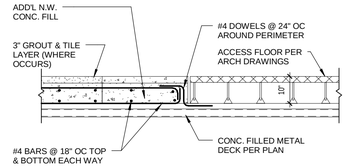
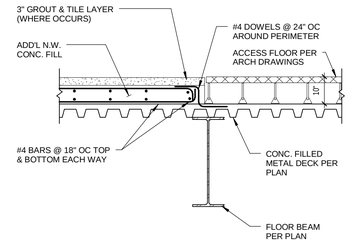


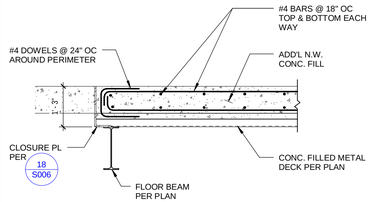
3 S503 SECTION AT RAISED SLAB ACCESS FLOOR

REF: S221 SCALE: 1/2" = 1'-0"



2 S503 SECTION AT RAISED SLAB ACCESS FLOOR

REF: S221 SCALE: 1/2" = 1'-0"



1 S503 SECTION AT RAISED SLAB

REF: S221 SCALE: 1/2" = 1'-0"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

ISSUE		
1	10/20/2008	30% PRICING
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3	12/12/2008	60% INTERNAL QA/QC & COST ESTIMATE
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5	02/16/2009	90% QA/QC & COST ESTIMATE

MARK	DATE	DESCRIPTION

DRAWN	Author	DATE
DESIGNED	Designer	DATE
CHECKED	Checker	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

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N232 COLLABORATIVE SUPPORT FACILITY

DETAILS

SIZE	CAGE CODE		REV
D	25307	A232-0800- S503	

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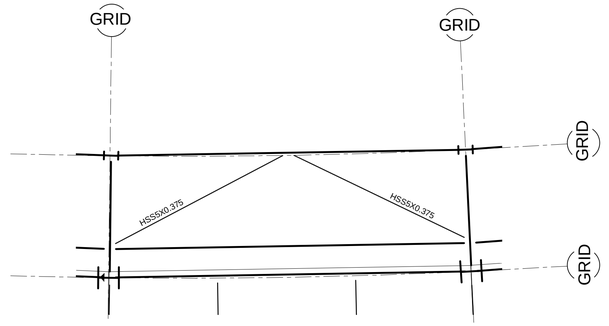

1 TYPICAL CANOPY FRAMING NORTH SIDE

S601 REF: S231 SCALE: 1/4" = 1'-0"

BLDG NORTH / TRUE NORTH

SCALE: 1/32" = 1'-0"

0' 16' 32' 64' 128'

PROJECT STATUS

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MARK	DATE	DESCRIPTION

DRAWN	J. NAGANO	DATE
DESIGNED	J. LIVERMORE	DATE
CHECKED	N. SHAH	DATE
PROJMGR		DATE
REQUESTOR		DATE
R&QA		DATE
SAFETY		DATE
SUPERVISOR		DATE

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ENLARGED CANOPY PLANS AND DETAILS

SIZE	CAGE CODE		REV
D	25307	A232-0800- S601	

SCALE | INDEX | SHEET OF

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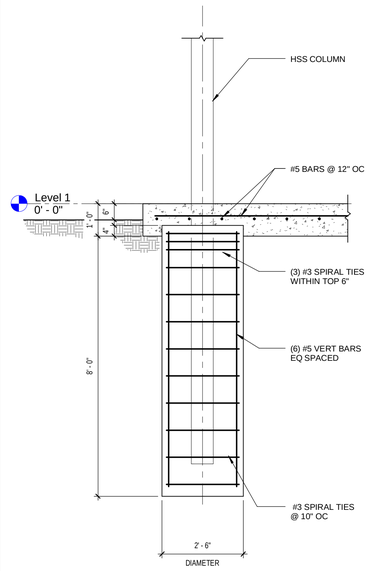
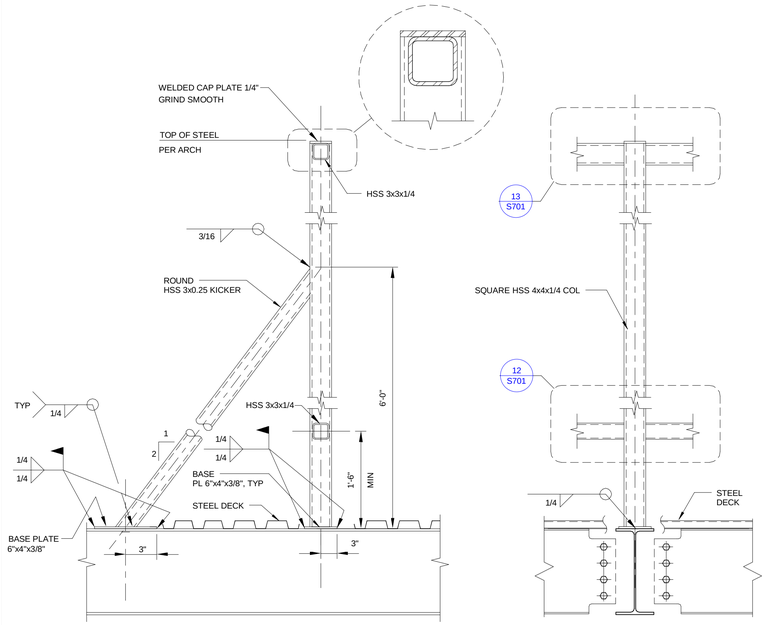


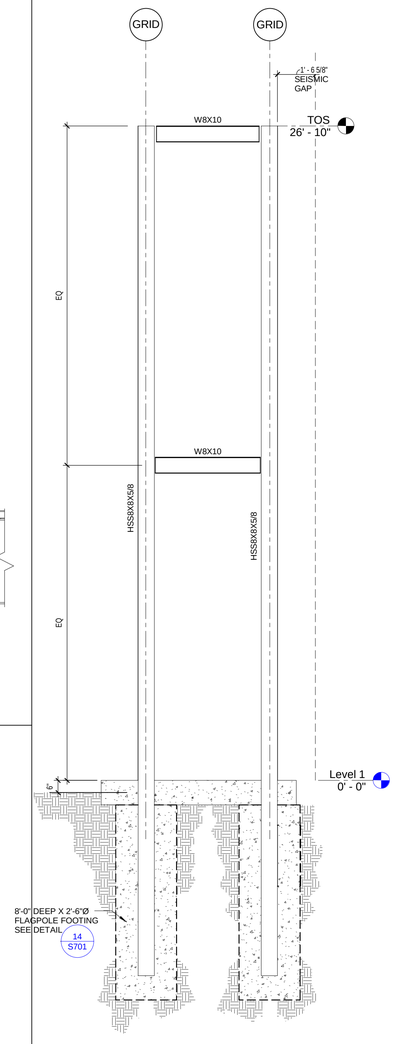
14 WING WALL FOOTING SECTION

S701 | REF: S211 | SCALE: 1/2" = 1'-0"



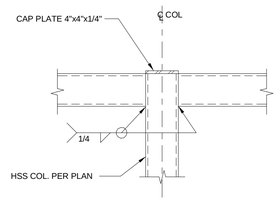
10 SCREEN WALL PERPENDICULAR TO BEAM

S701 | REF: | SCALE: 1" = 1'-0"



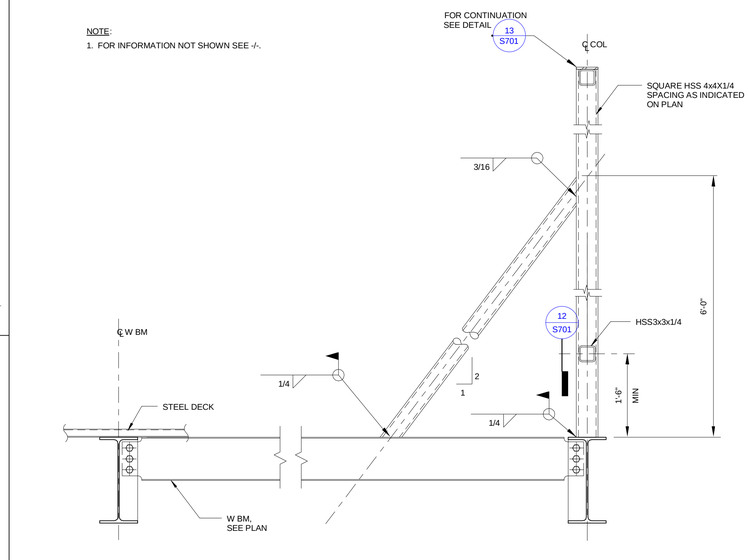
1 WING WALL FRAMING ELEVATION

S701 | REF: S211 | SCALE: 3/8" = 1'-0"



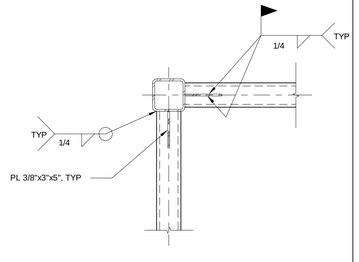
13 HSS CONNECTION TO HSS POST

S701 | REF: S701 | SCALE: 1 1/2" = 1'-0"



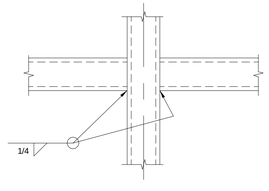
8 SCREEN WALL PARALLEL TO BEAM

S701 | REF: | SCALE: 1" = 1'-0"



16 HSS CONNECTION DETAIL

S701 | REF: | SCALE: 1 1/2" = 1'-0"



12 HSS TO HSS CONN. DETAIL

S701 | REF: S701 | SCALE: 1 1/2" = 1'-0"

PROJECT STATUS

PRELIMINARY-NOT FOR CONSTRUCTION

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PROJMGR	DATE	
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Moffet Field, California

N232 COLLABORATIVE SUPPORT FACILITY

DETAILS

SIZE	CAGE CODE		REV
D	25307	A232-0800- S701	
SCALE	INDEX	SHEET OF	

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